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THE CHESAPEAKE & OHIO RAILROAD:

ITS ADVANTAGES AS A

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THE
THROUGH PASSENGER AND FREIGHT ROUTE
BETWEEN THE
SEABOARD AND THE WEST,
TOGETHER WITH INFORMATION CONCERNING THE
AGRICULTURAL, MINERAL & MECHANICAL RESOURCES,
THE REMARKABLE
COAL AND IRON-ORE DEPOSITS,
AND THE

*Opportunities for Settlement, Investment, and the Active
Employment of Capital and Labor in Various
Industries along its Route.*

MAY, 1873.

FISK & HATCH, Bankers,
5 Nassau Street, New York.

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THE CHESAPEAKE AND OHIO RAILROAD.

The CHESAPEAKE and OHIO RAILROAD is now built and in operation from Richmond, where it connects with the navigable waters of the Chesapeake Bay, to Huntington, at the head of reliable navigation on the Ohio River, a distance of 420 miles.

The road possesses peculiar facilities for the most extensive and economical transportation of Western field produce destined for the seaboard States and for shipment to Europe, and of imported and manufactured goods for the great States occupying and adjacent to the Ohio and Mississippi valleys.

It has also special advantages as a very direct and attractive Passenger Line between the principal Western and Southwestern Cities and railroad-centers, and Richmond, Washington, Baltimore, Philadelphia, New York, Boston, and all important points in the Atlantic States.

It is also admirably situated to become a cheap and favorite route for European shipments and for immigrants destined for the West and Southwest, as, in addition to the present Eastern terminus at Richmond, it will also have a deep-water terminus directly upon the most central, commodious and unobstructed harbor on our entire North Atlantic coast, where the transfer from vessels to cars can be made at less expense, and with less interruption and delay, than at any other point at which European cargoes and passengers can find direct and convenient access to the interior.

CONNECTING WATER & RAILROAD LINES — EUROPEAN, SEABOARD AND INLAND.

At Richmond the Company have erected extensive wharves for the transfer of general freight and mineral traffic,

where cargoes can be transferred from the cars to vessels with great rapidity and economy. Vessels drawing 13 feet of water can always reach this port, and at high water for the greater portion of the year it will admit vessels drawing 16 feet. The large Coal and Iron business of the Road, the coastwise trade, and a considerable foreign business can be suitably accommodated at this point, as it is accessible at all times to vessels of average capacity employed in the coasting and foreign trade.

The Company have also in progress, for which all necessary authority and right of way, &c., have been secured, the construction of an extension of their line from the present terminus at Richmond, down the Peninsula between the York and James Rivers, to a point on the deep waters of the Chesapeake Bay, near the Capes at its entrance, where safe anchorage and sufficient depth of water can always be found to float the largest vessels in the world alongside the cars, and to and from which vessels may come and go without a pilot.

An excellent line of European steamers, the "ALLAN," are already running to the Chesapeake Bay, their vessels making semi-monthly trips between Norfolk and Liverpool. They will seek the wharves of the Chesapeake and Ohio Railroad Company, at its deep-water terminus, to discharge and receive cargoes and transfer passengers directly to and from the Company's cars, and by this means establish a close and direct line of travel and shipment between Europe and the Western States. Connection between these steamers and the present terminus of the Road at Richmond is now made by comfortable and commodious passenger steamboats on the James River and by rail *via* the *Norfolk, Petersburg and Southside* Railroad.

The managers of the Allan Line are prepared to increase the number of their steamers running to the Chesapeake Bay, when this deep-water extension is completed, and other lines of European Steamers will, without doubt, also

seek its wharves as the most central, commodious and advantageous point for transshipment of passengers and freight between Great Britain and the West and South.

The OLD DOMINION Line of steamships maintains a regular service between Richmond and New York, making close connection with the Chesapeake and Ohio Railroad. These vessels are large and commodious, admirably fitted, well kept and commanded by able and experienced officers, and the line is efficiently and thoroughly managed in all respects. The trips are made in about 24 hours to Hampton Roads, and about 36 hours to Richmond, and affords a pleasant and increasingly popular route for travelers, especially in summer, and for tourists and health-seekers *en route* for Virginia and the West. It forms in connection with the Road, by far the cheapest and best route for shipments of freight between New York and many points at the West and Southwest.*

At Richmond, the CHESAPEAKE & OHIO RAILROAD has rail connections *via* the *Richmond Danville & Charlotte*, and the *Norfolk, Petersburg and Southside* Railroads with all points in the Southeastern States, including Wilmington, Charleston, Augusta, Macon, Savannah, &c.; also *via* the *Richmond and Fredericksburg* Railroad with Alexandria, Washington and the North.

At Gordonsville, 76 miles west of Richmond, regular all-rail connections, with through trains, are made, *via* the *Orange and Alexandria Railroad*, for Washington, Baltimore, Philadelphia, and New York, forming with the steamers on the Ohio River between Huntington and Cincinnati, a very attractive Through Route for passengers to and from the West and Southwest. Through tickets can be obtained between New York and Richmond, Gordonsville, Charlottesville, Staunton, White Sulphur Springs, Charleston, Huntington, and Cincinnati, *via* the Chesapeake and Ohio Railroad. Passengers leaving New York

* For particulars in regard to through freight or passage applications can be made to H. W. Carr, General Freight Agent, at the Freight and Ticket Office of the Railroad Company, 229 Broadway, or at the Office of the Old Dominion Steamship Company, corner of Dey and Greenwich streets, New York.

in the morning can take sleeping cars at Washington and Gordonsville, arriving at White Sulphur the following morning; or leaving New York by sleeping car in the evening, can take elegant day cars from Washington and reach White Sulphur Springs, *via* Gordonsville, the following evening, in 24 hours travel; and Huntington in 9 hours additional.

At Huntington, the Ohio River terminus, regular connection is made with first-class lines of Passenger Packets for Ironton, Portsmouth, and Cincinnati; and through these with railroad and river lines for all points West and South. Excellent fare and comfortable travel is found on these boats. Through freight transportation and passage may also be had by steamboats and barges, between Huntington, and Louisville, Saint Louis, Memphis, New Orleans, and intermediate points.

Continuous railroad communication between the western terminus of the Chesapeake and Ohio Railroad, and Cincinnati and Louisville will shortly be completed *via* the *Louisville, Cincinnati, and Lexington* Railroad, one of the oldest railroads of the West, connecting the four chief cities of Kentucky, and the chief city of Ohio, with each other, and the *Elizabethtown, Lexington & Big Sandy* Railroad now being constructed, of which 33 miles east from Lexington are in operation under lease to the former Company. The remaining distance between the Big Sandy River, where it connects with the Chesapeake and Ohio R.R. 85 miles, it is expected will be finished by the close of this year or in 1874; when there will be a very direct all-rail line between Richmond and Louisville, 640 miles, with a branch line to Cincinnati, and extensions *via* Louisville to Saint Louis and the Far West.

Direct rail connection with Cincinnati will also be established by one or more roads following the Ohio River Valley. The *Cincinnati and Chesapeake* Railroad Company, organized under the laws of the State of Ohio, for the purpose of building a low-grade railroad from Cincinnati

nati to a connection with the Chesapeake and Ohio at Huntington, have made careful surveys of the route along the north bank of the river. The City of Cincinnati has voted \$1,250,000, toward the construction of a road upon this route, and towns and counties along the route, have appropriated additional sums, making an aggregate of nearly \$2,000,000. • The line is about 150 miles in length with no grades exceeding 15 feet per mile, and the road can be built at a very moderate cost. •

The *Southern Ohio Railroad Company* have completed thorough surveys for a line *via*. Hillsboro' to Dayton, which will form an important link in a through line between Chicago and the western terminus of the Chesapeake and Ohio. From Huntington to Dayton, *via*. Portsmouth, this road, as surveyed, is 155 miles, with very light grades and easy of construction. The same company contemplate a branch of their line from Hillsboro to Cincinnati, the distance from Huntington to Cincinnati, being by this route about 157 miles. A large amount of individual Stock subscription has been made; and as there are one or more tributary lines building or projected to connect Columbus, Urbana and Toledo with this road, and through it with the low-grade Trunk Line to the seaboard, it will no doubt be speedily built.

The Chesapeake & Ohio Railroad Company have a valuable and important franchise for bridging the Ohio River at Huntington, which gives them the entire control of the crossing at this point. The plans and estimates for the bridge have already been made, and it will be built in time to meet these connecting lines in Ohio.

The *Kentucky and Great Eastern Railroad Company*, organized under the laws of Kentucky, are constructing a road from Newport, opposite Cincinnati, along the south bank of the Ohio River to the Big Sandy terminus of the Chesapeake and Ohio. This line, as surveyed, is 146 miles in length, and will be a very valuable feeder of the Chesapeake and Ohio, and also an alternative connecting line to Louisville and Cincinnati. Considerable county aid has already been voted for its construction.

PAST HISTORY ; AND THE RECENT EXTENSION AND COMPLETION OF THE CHESAPEAKE AND OHIO RAILROAD.

THE CHESAPEAKE AND OHIO RAILROAD was formed by a consolidation of the roads, properties, and franchises of the *Virginia Central Railroad Company*, and those of the *Covington and Ohio Railroad Company*, authorized in 1866. Its charter privileges cover the line from the water on the James River to the Ohio River, at or near the mouth of the Big Sandy River, where the borders of the three States of West Virginia, Kentucky and Ohio touch each other, a distance of 427 miles, together with several important branches and extensions.

The *Virginia Central Railroad* was originally chartered in 1836—about the time when the great lines through Maryland, Pennsylvania and New York were started—under the title of the *Louisa Railroad*. Its title was subsequently changed, and its privileges enlarged, as above ; the State becoming a subscriber to three-fifths of the capital of the Company. It was extended westward from time to time, the State having built independently the road and tunnel across the Blue Ridge, known as the Blue Ridge Division, which was for a series of years operated under a lease, until 1870 when it was transferred by purchase to the present Company, and incorporated as part of its line.

Prior to 1860 the State of Virginia had, in the general furtherance of the plan of building a great highway between the Atlantic Ocean and the Ohio River within her own territory, constituted its Board of Public Works a corporation under the title of the *Covington and Ohio Railroad Company*, for the purpose of constructing that part of the through line between Covington and the Ohio River. This portion embraced the heavy work involved in crossing the Alleghenies. Work was begun and prosecuted at several points on the line, and several millions gold value, had been expended thereon, chiefly in tunnelling, rock-excavation and permanent embankments, which could not suffer appreciably by the lapse of time, when the State appropriations ceased.

Meanwhile the *Virginia Central* had been extended to Jackson's River, 195 miles west of Richmond. In 1866 the two portions of the through route were consolidated as one property, under a single corporation—the CHESAPEAKE AND OHIO RAILROAD Co.—the States of Virginia and West Virginia surrendering the property and rights in the Covington and Ohio line, within their respective territories. In 1867 the line was completed to Covington, 205 miles from Richmond; and in 1869 to the White Sulphur Springs, a celebrated summer resort, situated in West Virginia, 227 miles west of Richmond.

By the close of 1871 a section of about ninety miles had been finished between the Ohio river terminus at Huntington, and Kanawha Falls, the centre of the great Kanawha Coal Field. This link, though detached from the main line during the period required for the completion of heavy works at the eastward, became a valuable outlet for travel and shipments between Charleston, the capital or West Virginia, and the cities along the Ohio river, as well as for the Salt works and Coal mines along the railroad.

By the close of January, 1873, the rails of the Eastern and Western Divisions were united, and the whole road from Richmond to the Ohio River was opened for traffic April 1st.

CHARACTER OF THE WORK.

The road is of the standard guage, 56½ inches, common to the greater part of the American railroad system. In its construction the most modern and approved plans and materials have been adopted. Iron bridges have been erected in the portion recently built, with solid masonry abutments and piers for double track in important cases. Steel rails have been laid on a large part of the Western Division, over which a heavy mineral traffic passes, and other portions of the road are being relaid with steel; culverts and water ways have been made of more than ordinary massiveness and durability; and solid embankments have been built in place of temporary trestle-work.

Originally designed and laid out on a bold and thorough plan as a great central highway between the extensive system of internal navigation on the Western Rivers, and the most central and commodious harbor on the Atlantic coast line of the United States, it is a splendid achievement of modern engineering skill; and, in addition to its advantages in occupying the best natural passes over the Alleghenies, which designated it at a very early day as the most desirable central route between the East and West, it stood, at the date of its completion in a much more perfect condition, in its alignment, grades, construction, equipment, resources and connections, than any of the other great Trunk Lines at the same period of their history.

In the passage from the sea-shore to the navigable waters, of the west the road crosses the Blue Ridge and the Alleghenies, by very easy grades, the highest elevation attained being about 2,000 feet; and the descent on the Western slope is made with remarkably light and uniform grades and without noticeable undulations. The several ridges are cut through by natural water gaps, or depressions, which have, in places, also been tunnelled, far below the general level of the range.

No care or expense has been spared in its construction, which was necessary to render it a thoroughly first class and substantial railroad, and the liberal outlay for first construction in securing a solid and enduring road-bed, masonry, bridges and superstructure, which neither the lapse of time nor the action of the elements can seriously impair, will result in great saving in its maintenance and repair, and in the expense and regularity of its operation. The current expenses for renewals and repairs, both of the track and rolling-stock, will be much less than on more hastily and cheaply-constructed roads.

ITS ADVANTAGES AS A THROUGH ROUTE.

The need of increased facilities for transportation between the great fertile valleys of the interior, and the populous and busy States bordering on the Atlantic Ocean

has been recognized for years, and of late has attracted more general and earnest attention than almost any other question of public interest. The President of the United States in his public messages has recognized it as a question of national importance; political and commercial conventions have repeatedly brought it before the attention of Congress and Legislatures; and the National Congress, the Legislature of the Dominion of Canada, and those of several of our States, are engaged in the consideration of plans for the larger and more economical transportation of the surplus productions of our Western States, to the places where they are needed for consumption at the East and for shipment to Europe.

So great is the surplus at the West of the fruits of the field and the pasture, that all the railroads have more freight offered than they have cars to contain, engines to move, or tracks and warehouses to accommodate. Vessels on the Lakes and Rivers are not produced fast enough to meet the demand for tonnage.

High rates of freight and the profitable employment of all the available means of transportation, to their fullest capacity, are the natural consequences.

For a large part of the year (160 days) the navigation of the Lakes, the St. Lawrence, and the Erie Canal is virtually closed, and even during the 200 days of their operation all the avenues of transport and transfer are frequently largely overtaken. The pressure of local and higher-class, or "time freights" on the Trunk lines is such as to greatly limit the competition for the carrying of the more bulky articles of food and general utility.

Notwithstanding the natural obstacles of long routes, high grades, dear fuel, and expensive transfers at tide water, together with other expenses of handling and administration, with which some of the great East and West railroad lines are burdened, their earnings (and in most cases their net profits), have been enormous and constantly increasing from year to year.

The following tables show the rapid growth of the tonnage and earnings of the principal East and West lines.

TABLE SHOWING THE TONNAGE MOVEMENT ON LEADING EAST AND WEST
FREIGHT LINES.—TONS CARRIED:

	Erie Canal.	N. Y. C. & Hud. R.	Erie Railway.	Pennsylvania Railroad.
1840	1,416,046			
1845	1,985,011			
1850	3,076,617			
1852	3,813,441		456,460	
1855	4,022,617	776,112	842,055	365,006
1862	5,598,785	1,905,173	1,632,955	2,223,051
1865	4,729,654	1,767,149	2,234,350	2,798,810
1870	6,173,769	4,122,090	4,852,505	5,427,401
1871	6,467,888		4,844,208	6,575,843
1872	6,673,370		5,564,274	8,459,535

TABLE SHOWING THE GROSS RECEIPTS ON EAST AND WEST TRUNK LINES, FOR A
SERIES OF YEARS.

	Erie Railway.	N. Y. Central & H. R.	Pennsylvania R. R.	Baltimore and Ohio R. R.	Erie Canal. Tolls & Freight.
1840				\$432,883	\$4,195,549
1845	\$126,020			738,603	4,431,461
1850	1,139,559		\$339,452	1,341,805	5,763,388
1855	5,488,993	\$6,563,381	4,270,070	3,711,453	5,841,410
1862	7,863,972	11,994,356	10,304,290	4,481,859	10,780,432
1865	15,300,574	18,427,904	17,459,169	10,096,706	8,605,961
1870	16,179,461	22,363,319	17,531,707	8,427,718	7,552,988
1871	17,168,005	21,972,105	18,719,837	9,913,390	10,779,887
1872	18,371,885	25,580,676	22,012,525	10,654,472	

The capacity of the Western States for a still larger production is incalculable, and the demand for their products has no limit. The Mississippi Valley alone has the soil and climate, and will soon have population and machinery, that will enable it to feed the civilized world. The Commerce of the United States in Breadstuffs and other food supplies, is restricted only by the means of bringing forward its products within the reach of consumers. The utmost exertion on the part of the limited number of

lines available for this purpose, in building double and quadruple tracks and increasing their equipments cannot overtake the capacity of the Western States, nor of their supplies available for shipment.

The network of railroads in the Ohio and Mississippi Valleys exceeds 30,000 miles, and it is linked to the seaboard system by only five principal Trunk lines, (including the Chesapeake and Ohio,) aided for a part of the year by the Lakes, and their artificial outlets, the Erie Canal, and the St. Lawrence river and canals.

The magnitude of the production, marketable surplus, and shipment distribution, tonnage and travel may be better understood by reference to published Tables, showing the aggregate production of the Midwest States, the amounts of the leading articles received at the principal distributing and shipping ports, the amounts exported, and the gross and net receipts of the principal lines of transport.

The following extract from a Report made in 1869 by a Committee of the National Board of Trade, composed of members from all the principal cities and shipping centres of the country, on the subject of increased facilities for transportation between the West and the Eastern markets, conveys in forcible language some of the aspects of this problem; and also illustrates the value of the addition which the completion of the Chesapeake and Ohio Railroad has made to the means of its solution :

TRANSPORTATION TO MARKET THE GREAT NEED OF THE WEST.

“The problem now most seriously engrossing the attention of commercial men at the North, at the East, and throughout the West, is that of cheaper inter-communication between the great interior region of our continent and the seaboard. The necessity for its solution is becoming more and more urgent every day. The railroads are overburdened with freight, and are inadequate to its transport-

tation, at rates which draw it forth from remote parts of the interior.

“The question of cheaper transportation is only another form of the question of adequate means of transportation—for the moment that freight prices are so reduced as to permit produce to go to market, from where it is grown in the fertile West at a profit to the producer, immediately such a volume of it is mobilized as to overtax the capacity of the avenues of transportation. The problem of cheap carriage is therefore no other than that of adequate means of transportation.

“The productions of the interior are magnifying every year. They grow in aggregate more rapidly than the means of transmitting them to market can be multiplied. Western production is constantly pressing unduly upon the means of transportation. The multiplication of railroads in the interior is more rapid than that of railroads connecting the interior with the seaboard. The effect of the extended railroad and navigation systems of the West is to stimulate production more rapidly than existing lines of transportation can be augmented in capacity. Insufficiency in the means of outlet produces high freight charges, and the remark of all eminent writers on political economy is true, that impassable mountain chains interpose no greater barriers to trade than high prices of freights.

“EXTENT OF THIS INLAND TRANSPORTATION SYSTEM OF THE WEST.

“The stimulating causes now in operation to augment the production of the West are very powerful in their influence :

“1. The natural increase of population, augmented by the immense immigration from foreign countries and from the Atlantic States, is peopling the interior regions of the continent with a rapidity unexampled in the history of the human race ; and the production of the country is increasing in the same unprecedented ratio.

“2. The railroad system of the Mississippi and Lake Valleys has grown to an aggregate of 17,622 miles in length.* This system is acting as a powerful stimulant to the production of that prolific region in every part of it.

“3. The inland navigation of the West is of immense expansion. Official reports give the aggregate length of

* This was in 1869; at the close of 1872 there were 33,062 miles in 10 Western States.

steamboat navigation on the Mississippi and its tributaries at 16,674 miles. The flat boat and batteaux navigation of the headwaters and branches of these great streams increases this navigation by more than ten thousand miles; and in the course of a short time slack water and canal improvements will swell the grand total of Western inland navigation to at least fifty thousand miles. It will ultimately be considerably more if the European principle should obtain in this country, that every stream 19 feet wide and 18 inches deep may be rendered navigable.

"River navigation has assumed new importance of late by the inauguration of a cheaper and more efficient system of water transportation. On the Western rivers they have instituted the system of steam tugs and barges on a large scale. The effect is virtually to convert the river channels into railroads, the steam tugs being locomotives, and the barges being freight cars. Incorporated companies of large capital own the tugs and barges, and run them upon time schedules, just as railroad companies run their trains—the trains picking up barges as they pass different wharves and leaving others. The expense is but a fraction of railroad transportation, and the river channels are prized as nature's substitute for long railroad tracks. As there are nearly 17,000 miles of steamboat navigation on the Western rivers, the effect is virtually to add 17,000 miles of railroad track to the transportation business of the West. Thus the total length of our main lines of transportation in the West, on which steam is the motor, has reached 34,000 miles.

"The area of country embracing this vast system of railways and of navigation is nearly two millions of square miles; and when population reaches an average of fifty persons to the square mile, will contain one hundred millions of people whose leading industry will be agriculture.

"The stimulus imparted to production by the railway and navigation systems which have been mentioned, seconded by the unexampled growth of population there going on, is producing an immense development of export products. In 1860 there were eighteen millions of tons of produce to spare from the West, not one-half of which went off! It failed to go off either from the non-existence of sufficient means of transportation, or by reason of the prohibitory cost of freightage over great distances. What the amount of produce now is which could be spared for outside markets from the interior, cannot be stated with authentic accuracy, and the statistics of the forthcoming census must be

awaited. But it would be an under-statement to say that it has reached twenty-five millions of tons. On the other hand it would be an exaggeration to estimate that twelve and a half millions of these tons now go out to market over all the existing avenues of transit.

“The existing deficiency in the facilities of transportation increases as the centre of production recedes westward. A few years ago this centre was in Ohio. It has steadily retrograded through the States of Indiana and Illinois. It has now crossed the Mississippi, and is still moving westward. The centre of demand at the West for the necessary supplies from the East, including machinery, other manufactures and merchandise, salt, iron and coal, is receding with equal step into the far interior, to a still greater distance from the source of supply ; so that, while the demand for intercommunication is constantly increasing, the continually widening distance between the places of production and of consumption is adding to the expense of communication.

“Already very many of the products of the West, wanted at the East, will not bear transportation. Even in the State of Illinois, corn, the staff of life—needed at the East to fill hungry mouths—has been burned for fuel, on the score of economy, and in Dubuque, on the western bank of the Mississippi, within the last five years, corn in the cob has been burned for domestic purposes as cheaper than other fuel, the ruling price of wood being \$10 per cord, and of anthracite coal \$20 per ton.

“The area of country in the West which can be served by the Erie canal is continually decreasing ; for, as the country bordering on the lakes becomes settled up, the breadth of land under cultivation increases, and the produce from this increased cultivation, being nearer to the lakes, cuts off that from the far *West* by monopolizing the canal.

“To show the inadequacy of the present means of outlet for transmitting such a volume of produce as would be spared for market, we may estimate the maximum theoretic capacity of the Erie canal for through produce at seven millions of tons ; we may estimate the utmost capacity of all the railroads now leading across the Alleghanies at eight millions of tons, for *through freights*. It would be safe, to estimate the amount of Western produce which now goes out by the channels of the St. Lawrence and the Lower Mississippi, at four millions of tons. (The capacity of the lower outlets of the Mississippi and of the

Lawrence for discharging produce, is, of course, not measured by the quantity actually going out, but rather by the capacity of existing appliances for its shipment.) Thus, the utmost theoretic capacity of these several avenues of outlet does not exceed 19,000,000 of tons. The quantity of Western through tonnage actually moving over them is but little more than half this amount. Yet the present tonnage which could be spared by the West and which could be forwarded to market, if its products were mobilized by cheap carriage, and by ample avenues of transportation, would be twenty-five millions of tons. (See article I, Hunt's Magazine for August, 1868.) It is not therefore merely a question, whether we shall add new railroads to those already engaged in the work, or whether we shall merely open new canals, or whether we shall merely increase the appliances necessary for transmitting produce through the lower Mississippi and the Gulf. Resort must be had to all these expedients, and still there will be a grievous deficiency in the means of conducting the vast transportation.

“* * * Our Western grain must find its consumers in the populations near the Atlantic, and its markets almost exclusively in Atlantic ports. (Great Britain alone imports annually four millions of tons of grain.) It must all seek exit in the direction of the Atlantic; its natural tendency being to pursue the short direct route due Eastward, from the localities of production to the seaboard. There is no reason for believing that this tendency will ever be reversed or changed.”

These remarks are applicable to the whole West and Northwest, and are especially true of that vast and fruitful territory included in the water-shed of the Ohio River below the Kanawha, and the Mississippi below its union with the Missouri.

The early completion of the Erie Canal, and a little later the completion of the railroad lines connecting Lake Erie with the Hudson, gave to the navigation of the chain of great lakes artificial outlets to the sea, superior on the whole to the course of the St. Lawrence, (broken as it is by rapids and canals), and drew the current of Western freights to that route. In this way the great collecting centres, such as Chicago, Milwaukee, Detroit, Toledo and Buf-

falo were built up; grain for a time being drawn from the banks of the Mississippi and its navigable tributaries to the lake ports for shipment.

The maximum capacity of the Erie Canal and the other outlets of lake freights to the seaboard has been reached; and this route no longer meets the wants of the merchants and shippers along the Ohio and Mississippi.

By means of the "barge system" referred to in the Report quoted above, experience shows that it will be practicable to make of the Upper Mississippi and Ohio rivers the most continuous and effective inland water route of transportation accessible to Western products; and it has only awaited favorable and economical rail connection with the seaboard, to make it the most available and desirable route for a very large producing region.

Saint Paul, Dubuque, Burlington, Davenport, Quincy, Saint Louis, and other points, which formerly shipped grain to the Lakes, are now erecting elevators and constructing barges for, the conveyance of grain and other food supplies, in bulk, to those railroad lines, which, by their connection with these rivers at favorable points, afford the most convenient and economical means of transportation to the seaboard. Steam tow-boats of immense strength, carrying no freight, and with fuel enough for the round trip, are employed. The management of barges like that of freight cars, is independent of the motive power. The tug brings in a load of barges, and without delay takes out another and proceeds. Those on the Minnesota river tow 30,000 bushels of wheat each, or sufficient to fill 85 railroad cars; and on the Ohio river similar boats tow 6,500 tons of coal, or many times more than the longest railroad trains. But few men are required, and the expense of transportation for long distances, does not exceed that of the Great Lakes.

Hitherto the full advantage of this "barge transportation" could not be realized in consequence of some of the rail connections meeting it too far West and thus involving a long and costly land carriage; while the termini of

being on the upper part of the Ohio where shallows and obstructions offered serious hinderances, they were equally unavailable.

The Chesapeake and Ohio Railroad, with its low grades and its more favorable point of connection with the Ohio River, is, beyond all question, the most available rail auxiliary to the barge system, and the most convenient and cheapest outlet to the seaboard for the immense tonnage which the development of that system will concentrate on the Ohio River.

Among the special advantages of the Chesapeake and Ohio Railroad route for the transportation of the surplus productions of the West, and a corresponding movement of merchandise in the other direction which are attracting the attention of producers and shippers, are the following :

I. *Short Portage between the Ocean and Ohio and Mississippi River Navigation.*

II. *Direct Railroad Connections, in progress and projected, to the chief Cities of the West.*

III. *Light Grades and Curves.*

IV. *Cheap Fuel.*

V. *Genial Climate.*

I. *Short Portage connecting important Water Lines.* By a glance at the map it will be seen that the Chesapeake and Ohio Railroad has an Eastern terminus at the most westerly tide-water port of the North Atlantic Coast (Richmond), or, in other words, the port of shipment which is geographically nearest the centre of the Ohio and Mississippi Valleys, while at the same time it is nearer the open sea than Baltimore.

The deep-water or extreme eastern terminus of the Road will open directly upon the Chesapeake Bay ; by far the largest, deepest, most commodious and secure harbor of the entire Eastern coast ; the value of which as a sheltering roadstead, and as a commercial rendezvous, is well estab-

lished. It is always free from ice, and vessels can enter and leave it at all seasons of the year without obstruction. The sailing time between Hampton Roads and European ports is no greater than between New York and the same ports; while it is nearer the open sea than either Boston, New York, Philadelphia, or Baltimore.*

The western terminus of the Road is situated upon the Ohio River at the point where that stream begins its general westerly course; or in other words the most easterly point of its navigation in proportion to the total distance traversed; below the principal obstructions to navigation, and at the head of that part of the river which is swollen by large Southern affluents, and where longer seasons of navigation and better stages of water are combined than at any point higher up.

Connecting an inland river system of from 12,000 to 20,000 miles of navigable streams with the ocean commerce of the world by a low-grade route, the Chesapeake and Ohio Railroad possesses a very marked advantage for the transportation of freights between the East and West. Insufficient depth of water, shortness of navigable seasons, sand-bars, and other obstructions have, as before stated,

* Commodore Maury, of Virginia, better known to science as Lieut. Maury, from his researches on the laws of currents and deep sea lore, speaking of the relative merits of Norfolk and New York as commercial harbors, says of the roadstead in the vicinity of which the deep water terminus of the Chesapeake and Ohio Railroad will be located, and which is common to vessels seeking the wharves at Norfolk, Yorktown, or Newport News, thus describes it: "Geographically considered, the harbors of Norfolk or Hampton Roads and New York occupy the most important and commanding positions on the Atlantic coast of the United States. They are more convenient to the ocean than Baltimore, Philadelphia and Boston are, because they are not so far from the sea.

"Depth of water that can be carried out, and distance of the sea from

Hampton Roads, distant	15 miles—depth	28 feet
New York,	30 " 3¼ fathoms,	23 "
Boston,	" 100 " 3½ "	21 "
Philadelphia,	" 100 " 3¾ "	23 "
Baltimore,	" 160 " 2¾ "	16 "

"Between the three last and the sea there is a tedious bay navigation, but each of the first two is situated upon a well sheltered harbor, that opens right out upon the sea with beautiful offings, those of Hampton Roads surpassing the others in all the requirements of navigation, both as to facility of ingrees and egresses, certainty of land fall, depth of water, and holding ground."

He also shows, that to reach the Chesapeake, vessels cross the Gulf Stream at its narrower part, and take advantage of the eddies on its south-eastern edge; going in the opposite direction to Europe by following the Gulf Stream for a longer distance, will be helped along their course 50 to 100 miles per day.

rendered the cheaper transportation of the Western waters almost unavailable in connection with the other great East and West lines of Railway and have driven them, each in turn, to rely upon all-rail lines almost exclusively.*

For a good portion of the year, Steamers and barges can leave the Huntington wharves and proceed continuously to New Orleans and Shreveport in Louisiana, Natchez, Vicksburg and Yazoo, in Mississippi; Little Rock and Jacksonport, in Arkansas; Memphis, Nashville and Johnsville, in Tennessee; Cairo, Peoria, Alton and Quincy in Illinois; Saint Louis, and Saint Joseph in Missouri; Leavenworth in Kansas; Omaha and Sioux City, in Nebraska; Saint Paul and Lacrosse, in Minnesota; Davenport, Dubuque and Burlington in Iowa; Evansville and New Albany, in Indiana; Paducah Louisville and Covington, in Kentucky; Cincinnati, Portsmouth and Ironton, in Ohio. The tonnage of steamers and barges plying on those streams and other tributaries by the latest return, was 448,000 tons, of which 287,360 tons was propelled by steam.

Among the leading products of the Western States which can be cheaply brought to the seaboard by the water line to Huntington, and thence by the Chesapeake and Ohio Railroad to the coasting or foreign vessels, to great advantage, are wheat, indian corn, flour, pork, live stock, tobacco and cotton. The available surplus of grain from the territory naturally tributary to the Ohio and Mississippi Rivers, amounts to millions of tons. The figures showing receipts of flour, wheat and corn, at lake ports, and at the river cities, will give some idea of the actual movement of breadstuffs. But this falls far short of the capacity of the same region to furnish breadstuffs when the cost of transportation will justify their production and shipment. The number of cattle, sheep and hogs which find their way to the Eastern cities is not readily obtainable, but the receipts and shipments of cut-meats and salted provisions, and the number of hogs slaughtered at the principal packing

* Should it be found desirable, the Railroad can take the traffic from river barges and boats at the head of navigation on the Kanawha, at a point 87 miles east of Huntington. This would lengthen somewhat the proportion of the cheaper water transport but would reduce the land carriage to Richmond to 336 miles.

centres will give an idea of the immense tonnage from provisions alone.

The total production of Tobacco in nine Western States is stated at 171 millions of pounds, the greater part of which finds market and manufactive at the Eastern cities, and a large portion to Europe. The tobacco receipts at Louisville for a single year (1870) were 23,000 hhds, valued at \$4,823,000. The receipts of Cincinnati, Evansville, and St. Louis are probably as much more ; the inspections at Cincinnati alone in 1872, being 25,035 hhds.

In 1870, it was ascertained that no less than 350,000 bales of cotton were sent overland by rail from the river cities to the seaports of the North.

For the transportation of corn bacon, bulk meat, &c., from Cincinnati and other Western markets to the South Atlantic States, where very large quantities of these products are consumed, it affords a far quicker and more economical route than has heretofore been open to that extensive trade.

The Chesapeake and Ohio Railroad, with its connecting water lines, at either terminus, offers special inducements to shippers, all the above products destined to either home or foreign markets.

(2.) *Short All-Rail routes to the Western Cities.* The advantages of the Chesapeake and Ohio Railroad for through business are not confined to its favorable connection with water lines merely, nor to the carriage of freights alone. With the various rail connections, now in progress and projected, previously referred to, it will afford the best eastward exit and entrance of the Ohio Valley, whether considered in relation to available water transport or to continuous railroad routes. Both in distance and other working elements, it is a short, economical line between the seaboard and the principal cities and railroad centres of the Western States, and forms the most advantageous outlet to the Ocean for an immense system of Railroads extending southward to the Gulf of Mexico, northward to the chain of great Lakes, and westward to the Pacific ocean.

For passengers, or express freights destined beyond seas, and especially for such as are brought overland from the Pacific, it affords a direct route to the open sea without loss of distance.

The following table will illustrate the general directness of this route, and show the comparative distances between the several tide-water ports, and the chief cities of the West and Southwest. It will be seen that the advantage ranges from 30 to 300 miles in distance, and covers the principal cities, with the exceptions of Chicago and Columbus, where there is a trifling excess over two other lines, if linear measurement only is reckoned. With a due equation of grades it will be found to afford the shortest and best route to the seaboard even from those points.

TABLE SHOWING COMPARATIVE DISTANCES BETWEEN ATLANTIC PORTS AND PRINCIPAL WESTERN RAILROAD CENTRES BY ALL-RAIL TRAVEL, BY CHESAPEAKE AND OHIO RAILROAD AND ITS PROJECTED CONNECTIONS AND BY MORE NORTHERLY ROUTES.

MILES FROM PORT OF	To Cincinnati.	To Louisville.	To St. Louis.	To Memphis.	To Nashville,	To Columbus, O.	To Indianapolis.	To Chicago.
Richmond, via Ches. and Ohio.	573	*640	*890	1017	825	564	688	832
Baltimore, via Balt. and Ohio.	591	699	931	1076	884	517	705	828
Philadelphia, via Penn. R. R.	668	775	992	1152	960	548	736	823
New York, via Erie Railway.	861	997	1201	1354	1182	755	935	983
New York, via N. Y. Central.	883	940	1144	1354	1176	761	830	980
Boston, via N. Y. Central.	941	998	1202	1426	1234	829	888	1038

* Will be shortened 13 miles by improvements now in progress.

Between all points of the West or Southwest and Washington City—to which place as the National Capital there must always be a large passenger travel—the Chesapeake and Ohio, with its projected rail connections completed, will

afford the shortest and best communication ; and Chicago, Omaha, and points in the Northwest may adopt it with advantage. Comparing the distances between Washington and the large cities of the West, over the several routes, we find a saving of from 20 to 90 miles, in favor of the Chesapeake and Ohio Route.

TABLE showing the distances between Washington and Western cities *via* the Chesapeake and Ohio and other routes.

DISTANCE FROM WASHINGTON, VIA	TO CINCINNATI.	TO LOUISVILLE.	TO MEMPHIS.	TO NASHVILLE.	TO ST. LOUIS.	TO CHICAGO.
Chesapeake & Ohio Railroad.....	593	660	1,037	845	910	852
Baltimore & Ohio Railroad.....	613	720	1,097	905	953	852
Pennsylvania Central Railroad.....	646	753	1,130	938	989	842

Between New York and Southwestern cities, the advantages of the Chesapeake and Ohio Route are as decided for passenger travel as for the transportation of freights. From Saint Louis, Cincinnati and points further South, it will be nearer to New York than the Erie or Lake Shore routes. Estimating the influence of difference in grades, it will also be shorter, in time, between the same points than either the Pennsylvania or Maryland lines.

From New Orleans, Memphis, and the lower Mississippi, the Chesapeake & Ohio is the most direct and quickest route to all points along the seaboard.

DISTANCE FROM NEW YORK, VIA	TO LOUISVILLE. MILES.	TO MEMPHIS. MILES.	TO ST. LOUIS. MILES.	TO NEW ORLEANS.
Chesapeake and Ohio R.R. via Wash'n..	888	1,265	1,138	1,394
Erie Railway, via A. & G. W.	997	1,354	1,201	1,751
N. Y. Central, via Lake Shore and M.S.	940	1,354	1,260	1,694

III. *Light Grades.* The line of the Chesapeake & Ohio Railroad is remarkable for the uniformity and lightness of its grades. From the Western terminus of the Road at the

Ohio River, to the summit of the Alleghanies, 208 miles, the grades are without noticeable undulation, and with a nearly uniform ascent, averaging 10 feet per mile, and in no case exceeding 30 feet per mile, or 1 in 175. From the summit eastward to Clifton Forge, where the line crosses the waters of the James River, a further distance of 23 miles, the grades are descending, nowhere exceeding 60 feet per mile. On the remainder of the line to Richmond the average grades are light, there being less than ten miles, in all, exceeding 60 feet; and at these points a reduction to the maximum of 60 feet is practicable.

The full force of this advantage and of long stretches of level, or nearly level, track may be better understood by the statement that the same freight engine will be able to leave Huntington on the Ohio River with its maximum load (of say 50⁰ cars), and proceed without interruption eastwardly for 231 miles, across the summit of the Alleghanies, at a nearly uniform speed, without encountering any opposing grade of over 30 feet per mile, and without requiring any auxiliary power.

Other east and west Trunk lines are now resorting to every practicable expedient, and preparing to expend large sums, to reduce their grades, which in some cases are as high as 120 feet per mile.

In the carriage of heavy freights, such as produce, coal, iron, and other minerals, as well as of passengers and the "quick-despatch" freights, low grades are of the utmost importance both to the rapidity and the economy of transportation. The following table, compiled from the published data of a large locomotive manufacturing establishment, in Philadelphia, gives the relative hauling power of freight engines over different grades, showing a very rapid loss of power as the grades increase :

"MOGUL" FREIGHT LOCOMOTIVE.

Maximum load on level grade.....	1,400 tons.
" " 20 feet	655 "
" " 40 " 	415 "
" " 60 " 	300 "
" " 80 " 	230 "
" " 100 " 	180 "

IV. *Cheap Fuel, &c.* In the supplies of equipment machinery, rolling stock, castings and wrought-irons, timber, fire-wood, lubricating oils, and other items, involving large expenditure for the operation and maintenance of railroads, the Chesapeake and Ohio Railroad has very decided advantages. The "Tredegar" engine and car works, one of the largest establishments of the kind in the country, is situated at one end of the line; and the Company's principal locomotive and machine shops, and the "Ensign" car-wheel works are established at the other end; the iron and coal being drawn to each of them from the furnaces and mines along the line of the road. Timber, of all desired sorts, borders the line; the oils of West Virginia are the best known for railroad uses; labor is cheaper than the average cost elsewhere.

In fuel for locomotives, which is one of the largest items of expense in railroad operation, it has unrivalled advantages. The best steam coals abound in thick seams in close proximity to and above the level of its track; and can be supplied to its locomotives at the bare cost of handling. It is believed that the Company's entire supply can be furnished for an indefinite period at from one dollar to one dollar and a half per ton, or from one-half to one-fourth the average cost of fuel to other lines.

V. *Genial Climate.* Lying along and near the 38th parallel of latitude, the Chesapeake and Ohio Road enjoys a mild and equable climate, exempt from extremes of heat or cold. The winters are much shorter and more temperate than in Pennsylvania or New York. There is never any obstruction from deep snows, nor liability to interruption from extreme frosts. The losses to which more northerly lines are subjected, and the delays and disadvantages to shippers resulting from these causes in winter, will be unknown upon this route; and its general and uninterrupted freedom from obstruction and delays during the seasons when the efficiency of some of the most important routes is more or less impaired, will render it the most desirable winter route for both freights and travel.

Statistics show that the navigation of the Virginia Canal during the 20 years, 1851-1871, was suspended by ice and other climatic causes, for an average period of only 15 days; and for several years in succession it was not interrupted at all. The average period of suspension on the Erie Canal was from 90 to 120 days, and has reached 150 days.

RESOURCES AND ATTRACTIONS OF THE COUNTRY ALONG THE ROUTE OF THE CHESAPEAKE AND OHIO RAILROAD.

The region traversed by the Chesapeake and Ohio Railroad is by reason of its natural advantages of soil, climate and agricultural and mineral wealth, one of the most attractive and inviting in the United States, and offers at the present time probably greater opportunities for the active and profitable employment of capital and labor than almost any other section of our country.

It abounds in almost every element of material prosperity, health and enjoyment, and opens to tourists, capitalists, coal operators, iron workers, manufacturers, mechanics and farmers a field unequalled in the great variety and rare combination of its advantages.

Many of the remarkable resources peculiar to the region traversed by the more recently opened portion of the road, though long known to scientific men and explorers, have, in the absence of available communication, been heretofore secluded to a great extent from practical utility and development, and from popular knowledge.

The completion of the railroad gives to them at once a new interest and importance, renders them accessible to capital and industry, and brings them into quick and economical communication with the great centres of consumption and commerce.

So great is the interest which the opening of the Railroad has awakened throughout this country and in Europe, and especially in England, respecting the advantages for settlement; the opportunities for the investment of capital in the purchase and development of agricultural, iron, coal and timber lands, and the facilities for business enterprise, along the route: and so numerous are the enquiries addressed to us for more specific and detailed information than has heretofore been given in condensed and collected form, that we present in the following pages a brief and comprehensive sketch of some of the most important of these resources and advantages, and their prominent localities, with some

directions and references calculated to be of interest and service to persons desiring to visit or investigate them.

Among the most conspicuous and available are :

(1) *Soils of great variety and fertility, adapted to every branch of husbandry, field, fruit and vine culture, and the raising of live stock ; forests of the best Oak, Yellow Pine, Walnut, Poplar and other valuable Timber, with an admirable climate, and choice farm and timber lands at moderate prices.*

(2) *Extensive deposits of Iron Ores of great variety and richness, with abundance of Limestone, Timber, cheap fuel, and other conditions for the profitable manufacture of Iron.*

(3) *The great Kanawha Coal fields, containing the best Cannel, Splint and Bituminous Coals in veins of remarkable thickness and purity, situated above the level of the Railroad, and accessible at a very low cost for mining.*

(4) *Salt Wells, Roofing Slates, Cement, Gypsum, Clays and other miscellaneous minerals of commerce, and superior materials and advantages for the production of Soda-ash, Bromine, &c., &c.*

(5) *Favorable locations, and the material accessible at a low cost, for almost every variety of manufacture and mechanical industry, Water Power, &c.*

(1) SOILS AND AGRICULTURAL LANDS.

In its course from the ocean to the Ohio River, the Chesapeake and Ohio Railroad passes centrally through the two great States of Virginia and West Virginia, touching some of the oldest and largest towns and cities, and passing through some of the richest and most productive lands, embracing nearly all varieties of soil, herbage, and climate to be found within the temperate latitudes.

The geological formation, the topographical features, the water-shed and the elevation above sea-level give to the several portions of the territory distinctive characteristics which have caused them to be designated separately as the

“Tide-water,” the “Middle,” “the Piedmont,” the “Blue Ridge,” the “Valley,” the “Mountain” or “Appalachian,” and the “Trans-Appalachian or “Ohio Valley” regions; each and all of which have unusual agricultural attractions, and are suited to the widest range of agricultural pursuits.

The Tide-water Region, consists of a series of extended peninsulas, whose sides are washed by the Chesapeake Bay, and tidal rivers (most of them navigable), affording a long and irregular coast line, with easy access to the markets of the seaboard, and to the interior towns and cities. The land is well drained; generally free from marsh, with a soil of clay, marl, and sand, and an overgrowth of pine and oak.

The principal item of land culture in this region is market gardening, for which it is well adapted; the spring season in the warm lands in the vicinity of Norfolk, Newport News and Yorktown opening by the first of February. The annual shipment of early vegetables to New York by sea is estimated at \$20,000,000, exclusive of the amount sent inland, and the trade is steadily increasing.

A large amount of farming land is under cultivation, the staple crops being Indian corn, wheat, potatoes, sweet potatoes, and peanuts. In one of the counties, bordering on the James River, the average yield of wheat, for the plantation, was 35 bushels per acre. Orchard fruits are also grown and shipped, to a large extent.

Good farming lands are to be had at points along the peninsula bounded by the York and James Rivers, at prices varying from \$10 to \$50 per acre, according to their proximity to the navigable channels, or to the railroad line. Labor is abundant, and the cost of living low. The “marl” found but a short distance inland, and the limestone crossed by the railroad can be cheaply and abundantly supplied as fertilizers, and an unlimited market invites to the rapid expansion of the industries of this and the adjacent region.

The waters of this Bay, and its numerous indentations are almost as valuable to commerce as the lands; the extensive oyster beds and fisheries being among the best in America. Oysters are shipped from Norfolk and vicinity to eastern seaboard cities in immense quantities. The total amount drawn from these waters annually is estimated at 30,000,000 bushels; the state tax being collected on 20,000,000 bushels. Large quantities of oysters, as well as of shad, herring, and other fish, are now sent to the cities of the Ohio and Mississippi Valleys, by the Railroad.

The location of the deep water terminus of the Chesapeake and Ohio Railroad, near the extremity of the chief peninsula of this tide-water region between the York and James Rivers, and the growth of an important seaport at that point, will impart a new activity to all that region, and greatly increase the value of its productive resources.

The Middle Country has a width of about sixty miles, and an area, of 12,000 square miles. The rivers of the interior and the tidal waters of the ocean meet at its eastern edge, as the former fall over the uplifted granite rim, bringing together navigable water courses to the sea and numerous and effective water-powers, and making of inland seaports, advantageous sites for manufacturing, milling, and other industries. The James River falls about 70 feet near Richmond, yielding a power for milling purposes exceeding that of Lowell.

The surface of the country consists of slight undulations, with a gradual ascent to 500 feet above sea level at its western border at the South West Mountain, as it is locally called, a low, outlying ridge, having a general elevation about 500 feet above the plain at its base, whose sides and summits are, for the most part, arable land. The soils formed from a variety of rocks, are various, ranging from the light brown of the ridges, to the rich, dark brown of the bottom lands.

The principal farm products are wheat, corn, flax, grass seeds, sweet potatoes, oats and tobacco, with a

large representation of cattle sheep, etc. The three counties of Henrico, Hanover, and Louisa, of this belt, which are traversed by the railroad, may be taken as specimens of the average. Their productions were, according to the census of 1870 :

Acres improved,	315,196
Acres unimproved,	302,564
Cash value of farms,	\$11,055,990
Value of all live stock,	818,209
Wheat crop (bushels),	329,859
Corn crop (bushels),	504,625
Tobacco (pounds),	1,380,835

In 1860 the average production of tobacco, was 246 pounds to each inhabitant. The average value of farms in 21 counties, was, in 1860, \$12.50 per acre. Lands in these counties are held at low prices, improved lands being obtainable at from 15 to 20 dollars per acre. No part of the belt is distant more than 10 or 12 hours from the tidewater ports by railroad, and it is thus within easy reach of good markets.

The poorest of the soils may be enriched by the abundance of the marl or "green sand," a fossil manure of great value, which is found and worked along the course of this railroad, the beds having in places a depth of 15 feet. More than a million tons per annum of the same description of marl have been dug and distributed in the State of New Jersey, (Monmouth county alone furnishing 600,000 tons), where its value as a fertilizer is well understood, and creates a large demand for it at high rates.

The gathering and grinding of sumac leaves, found in abundance in this and other sections of Virginia, along the route of the railroad, is another important source of profit to farmers. The value of the extracted dye-stuff is superior to that of Sicily, and it commands a high price in English markets. The demand for it is almost unlimited, the importations into the United States being 2,000,000 pounds annually.

Inquiries concerning lands held for sale in Eastern Virginia, adjacent to the line of railroad, may be addressed to Gen. Wms. C. Wickham, the Vice President of the Company, at Richmond.

The Piedmont Region, as its name indicates, consists of the foot slope of the Blue Ridge, and is divided into a tier of counties covering an area of 6,000 square miles. There were in 1860 some 2,000,000 acres in cultivation. About the same quantity unimproved was inclosed in farms, leaving over half a million acres as wild land. These proportions had not greatly changed up to 1870 ; but of late there has been a considerable influx of immigrants from the northern States and Europe, who have been enabled to purchase improved estates, with fences and good buildings on them at from \$15 to \$50 per acre, including improvements.

It is crossed by the Railroad in Albemarle County in a distance of twenty-five miles. It includes several spurs or ridges lying within the enclosing hills, all of them arable to their summits. By soil, climate, scenery, chemical constituents, and distribution of water, these lands are entitled to rank among the finest in America. The variety and exuberance of the productions attest their capacity for agriculture. The soil is for the most part a friable, red crumbling loam, very easily worked.

To a population of 202,282 in thirteen counties, according to the census of 1860, there were over \$7,500,000 worth of live stock ; eight millions of bushels of cereals, or forty bushels per capita, were raised, and of tobacco 24,000,000 pounds, or 120 pounds per individual. The grasses, grains and orchard fruits of this part of Virginia are celebrated. Prof. Ridgway, in a Geological Report of this region, says :

“The Piedmont District, in Albemarle and Nelson Counties, has a “mixed subsoil, rich in fertilizing ingredients, such as lime, magnesia, “potash, oxide of iron, &c., derived from the rocks beneath. Hence “wheat, corn, oats, tobacco, the natural Virginia blue grass, English “sward, clover, timothy, orchard and herd’s grasses flourish luxuriantly ;

“also fruits of various kinds, the pippin apple, pear, and grape attaining “unusual dimensions, flavor and perfection.”

By the census of 1860, Albemarle County showed a population of 26,000; with 700 square miles of territory, half of which was enclosed in 900 farms, 500 of which contained over 500 acres each. Its annual products were:

Wheat, Corn and Oats—(bushels)	1,250,000
Tobacco—(pounds)	5,500,000
Potatoes—(bushels)	40,000
Wool—(pounds)	40,000
Butter—(pounds)	200,000
Live Stock—(head)	60,000
Value of products of farms,	\$2,000,000

The Blue Ridge Country has the same general characteristics, of the Piedmont and Valley districts, and these together form pre-eminently the Fruit and Grain region of Virginia.

Major Hotchkiss, of the University of Washington and Lee, in a paper on “The Resources of Virginia,” read before the Society of Arts in London, and reported in the Journal of the Society in February, 1873, in referring to this section, says:

“Some 3,000 square miles, or two million acres, of Virginian territory “pertain to the Blue Ridge—a region twice the size of your Sussex—most “of it covered with a fine growth of original oak, hickory, chestnut, and “tulip-poplar forest, with here and there a valuable grazing or fruit farm, “a patch of lighter green on the sides or summits. These greenstone “rocks, as is well known, crumble into soils rich in color and in the elements of fertility—soils especially adapted to the wants of the vine, such “as most of the world’s great vineyards are situated upon. The forests of “the Blue Ridge abound in grape vines of a large size and very productive—the originals of the Catawba, Norton’s Virginia, and other well-known American grapes; and thousands of gallons of brandy are annually distilled from these by dwellers along the mountain—one man “having made 11,000 gallons in a season. Recalling what was “said of the topography of this range, it will be seen that almost “any aspect can be chosen for a vineyard; the soil has a special adaptation to the vine, the latitude—that of France—gives length of season, “while the elevation, above the “frost line” of the valleys, secures the

“maturity of the grape—an indispensable requisite for the production of good wine. Numerous vineyards are now in successful operation; at Belmont, near Front Royal, is one, covering some seventy-five acres, that has now an annual yield of 20,000 gallons of wine, the pure juice of the grape, and 10,000 gallons of brandy, the vines that are in full bearing yielding from 300 to 500 gallons of wine to the acre. The grapes are notably rich in saccharine matter, and diseases of the vine are unknown. Nearly a million acres here are adapted to this culture, and offer a pleasant and profitable field, and a virgin soil in a most genial climate for this leading industry.

“This section has also an established reputation as a fruit-producing one,—its apples, pears, peaches, and other temperate climate fruits attain a flavor and perfection rarely equalled elsewhere; its Albemarle pippins command prices that have induced the planting of large orchards of that single variety. It is no uncommon thing for 500 bushels to be gathered from an acre, and an English eighteen pence per bushel would yield a large profit to the orchardist. The day is not distant when Blue Ridge apples will form a staple article of export to Europe, and one of the greatest blessings that can be conferred upon any people is an abundance of cheap fruits to take the place of stimulating drinks.”

As has been stated, there is still abundance of unimproved land for sale in this section, and here and there are improved farms which may be had at prices which, though higher than those further east and further west on the line of the road, are nevertheless comparatively cheap in view of their natural advantages and nearness to market.

The Valley Region. Between the Blue Ridge and the next range of hills to the west lies the *Shenandoah Valley*, or, as it is sometimes called, “The Great Valley” or the “Limestone Valley of Virginia.” It is a continuation of the famous Goshen Valley of New York State, and the Lebanon and Cumberland Valleys of Pennsylvania, though having far greater dimensions. It is crossed by the Chesapeake and Ohio Railroad in a distance of 35 miles. At Staunton the Valley has an elevation above sea-level of 1,100 feet, and is shut in and sheltered by enclosing ridges 3,000 feet on the eastern or Blue Ridge side, and 1,000 feet higher on North Mountain side.

The Valley is notable for its grain and grass-growing

capacity. It includes about 5,000,000 acres of land, of which 1,700,000 are under some form of cultivation; 1,800,000 additional being enclosed in farms; and the remainder, or a third of the whole, available for fresh settlements.

Some idea of the productiveness of its soil may be gathered from the census figures of 1860, which gave as the total value of farming implements, \$7,000,000; with 58,000 horses, 2,000 mules, 49,000 milch cows, 3,500 working oxen, 101,000 other cattle, 139,000 sheep, 254,000 swine; 606,500 head in all, valued at \$8,000,000. The annual value of animals slaughtered was \$1,850,000; the wool clip was 500,000 pounds, the flax yield 66,000 pounds, and from these a domestic manufacture of \$250,000 was reported. The wheat product was 3,250,000 bushels, corn, 5,500,000 bushels, besides large crops of rye, barley, oats, buckwheat, &c.; 370,000 bushels of potatoes, 120,000 tons of hay, 27,000 bushels of clover seed, 25,000 bushels of grass seed, 2,750,000 pounds of butter, 55,000 pounds of maple sugar, 171,000 pounds of honey, and 3,000,000 pounds of tobacco.

There are also raised large quantities of sorghum, syrup, wax, hemp, hops, silk, wine, cider, peas, beans, cotton, orchard products, and other items, showing great variety in the resources and industry of this part of the State. Its comparative productiveness at that date is shown in the facts that, while it had but 1-142 part of the whole population of the United States, it had 1-107 of the horses, 1-174 of the cows, 1-146 of the other cattle, 1-156 of the sheep, 1-132 of the swine, 1-135 of the value of the stock raised, and 1-57 (or nearly three times the average production) of the wheat, 1-120 of the wool, 1-115 of the oats, 1-35 of the clover seed, and 1-95 of the value of land under cultivation.

Augusta County, through which the railroad crosses the head of the Valley, is one of the richest in the State, in agricultural values, and is underlaid with mineral treasures of vastly greater value, more particular reference to which is

made in the pages following, under the head of Iron Ores. Its population and products, and the value of its agricultural lands, will be greatly increased with the great impulse which will be given to iron ore mining and iron manufacture, by the recent opening of the Railroad, through to the abundant and cheap fuels of the Kanawha Valley, and to the iron furnaces of Ohio and the West, for which the Virginia ores are likely to be in great demand.

The rapid multiplication of iron ore mines and blast furnaces will afford a large home market for the surplus and increased production, which will still further add to the general prosperity which distinguishes this Valley. Limestone of the purest kind being the bed rock of this region, it is cheaply dug, and by means of cheap coal-screenings drawn from the Kanawha, can be cheaply burned into lime for fertilizing purposes, and must be in large demand for flux in iron smelting.

The leading items showing the present condition for agriculture of this county, as shown by the census of 1870, are as follows, viz. :

Acres improved,	222,843
Acres unimproved,	178,028
Cash values of farms,	\$10,232,552
Annual value of farm products,	\$2,130,430
Value of animals slaughtered,	\$346,890
Value of all live stock,	\$1,086,917
Crop of wheat, (bushels,)	463,276
Butter, (pounds,)	353,335
Wool, (pounds,)	23,291

Numerous English settlers have recently purchased farms and estates in this vicinity.

Agricultural and wood-lands in this and adjoining counties are still to be had at moderate prices, \$25 to \$50 per acre ; those containing the mammoth veins of hematite ores, or timber lands adjacent thereto, being held at somewhat higher prices.

The Mountain or Appalachian Belt of country has a width varying from 20 to 50 miles, and is about equally divided between the two States—Virginia and West Virginia—and consists of a great number of comparatively long and narrow valleys, formed by the head-waters of the Potomac and James River draining the eastern slope, and by the Monongahela and New Rivers flowing toward the Ohio. The population of the 20 Counties (ten on each side of the boundary) was 142,336 in 1860, and 148,509 in 1870, a gain of near $4\frac{1}{2}$ per cent, or an average of twenty persons to the square mile.

As may be imagined from the rugged aspect of the country, there are on the mountain slopes hundreds of thousands of acres of dense, unbroken forests. The prevailing timber consists of oak, hickory, pine, spruce, cherry, maple, walnut, beech, and poplar. It is not uncommon to find a hundred trees upon an acre, of hickory, white oak, tulip-poplar, or wild cherry, from each of which a stick of two feet in diameter and forty to fifty feet long may be hewn; besides pines and spruces of still larger dimensions. The consumption of timber from the mountain districts of this same range in Pennsylvania and New York has been very large; a single County in the former State having sent to market 500 millions of feet in a single year, at an average rate of 17 cents per cubic foot.

The want of railroad facilities has heretofore kept the Virginia forests out of market, while the price of timber lands in the two States above mentioned have greatly advanced in value as the railroads penetrated them.

The opportunity is now afforded by the Chesapeake and Ohio Railroad to ship large quantities of hewn and sawed timber to both eastern and western markets from the cheaper Virginia forests. Lands can now be had in fee simple for from \$10 to \$25 per acre, from which timber to ten times the value could be cut from nearly every acre, and leave a large profit to the shippers, after payment of all expense of cutting and hauling to the railroad.

Howell Fisher, a practical Pennsylvania coal operator and iron master, who has made this region a special study, visiting it many times, says in regard to the agricultural capacities :

“On climbing up these mountains it is found that all the slopes and hill-sides made by the numerous streams, and the table-lands on top, are covered with a rich mellow soil that raises with ease, and yields finely, wheat and corn, and particularly oats, potatoes, and all root crops in great abundance. This is the unanimous testimony of all persons acquainted with the country. On the south of New River, tobacco, said to be the finest sent to the Cincinnati market, is raised as easily and abundantly as in any part of old Virginia.

“Cattle and sheep fatten and flourish on the herbage and undergrowth without other food, and with literally no care. The size of the sheep thus raised is stated by an intelligent gentleman, who has frequently passed through this country, and had his attention called to it, to be much greater than common, and their hardihood unusual.

“With this fertile soil, with a good climate, with the excellent water that always belongs to coal strata, and with unsurpassed healthfulness, this country, mountainous and hilly as it is, would have been filled with a hardy, industrious, and thrifty population, instead of the few settlements that are now met with, were it not for two causes, the principal one of which has been want of communication and market, and the other the magnificent growth of timber with which the land is covered.

“This consists of large white, black, red, and chestnut oaks ; black and white hickory, black walnut, ash, poplar, wild cherry, and chestnut, with occasional groves of the maple, and valleys of some size of the white pine and hemlock. There are other varieties, such as the dogwood, gum, etc., etc., which are not so numerous. When for some time among these forests, one does not so feel their size, but upon leaving the coal strata and coming to the Alleghanies, the trees there look dwarfish and the woods like a collection of brush.

“To the European immigrant, unaccustomed to the use of the axe, this fine growth of timber has been deemed an objection, and he has wended his way to the prairies of the West—with their chills and fevers, which most surely destroy the general health of his family—rather than undergo the unaccustomed task of clearing, in the mountain forests, the acres he needs. Even to our American woodsman this has been a serious task, arising from the necessity that heretofore existed of destroying the timber to get rid of it, in addition to the ordinary labor of clearing. Land, when rid of this valuable timber has hitherto been worth five times as much as when covered with its natural growth.

“But, with the railroad opened, giving easy access to Eastern and

“Western markets, all this is changed. There is a demand for the forest products and a road to market. The car builders, the cabinet-makers, and the numerous industries, dependent upon cheap lumber, will necessarily come along the line of road. The unlimited supply of good bark will bring tanneries and their associate industries; and when to these demands is added the timber that will be marketed in bulk, and the large consumption for mining purposes, it will be seen how acre after acre will soon be opened to the husbandman, not only without cost, but with a large profit for the labor of clearing.”

Although notably a timber growing country, the mountain portion of Virginia and West Virginia is by no means destitute of general agricultural attractions. The extensive table-lands and numberless valleys are suited for corn and grass culture, the soil being exceedingly rich and deep. There are also extensive plateaus, or table-lands, between the depressions caused by the washing of the streams, upon which are fine grazing and orchard lands.

It has been estimated by the Department of Agriculture that a steer can be fattened from the nutritious blue grass and corn of this section cheaper than in any other part of the country east of the Mississippi, and it is much nearer the great cattle markets than the Western grazing States.

There are still millions of acres available for field culture, orchards, vineyards, sheep pasture, etc., which are held as wild lands, and which may be had at from \$1 to \$10 per acre, according to their surface peculiarities and proximity to the railroad.

The Greenbrier Valley, one of the largest and oldest settled of these depressions, is famed for its salubrity, beautiful scenery, and general adaptability to farming pursuits. In appearance it resembles the renowned Wyoming Valley of Pennsylvania, having, however, a more luxuriant vegetation and finer views. The Railroad enters this valley near the White Sulphur Springs, and follows its course to its confluence with the New River Valley, a distance of 35 miles. The substratum of nearly pure limestone which underlies this valley furnishes a rich soil. The limestone will

be largely in demand for commercial, agricultural and mechanical purposes.

The climate of this belt of country is exceedingly favorable for man and beast. The isothermal line of 55 degrees passes diagonally across it. At Lewisburg, elevated 1,800 feet above the sea, overlooking the Greenbrier, the average temperature in the Spring months is 54 degrees, of the Summer 73 degrees, the Autumn 56 degrees, and the Winter 35 degrees, giving an annual mean of 55 degrees, or about the same as Baltimore and St. Louis, and higher than that of Philadelphia and Cincinnati.

The Trans-Appalachian or Kanawha and Ohio Valley Region, or as it may be called, the western foot slopes of the Allegheny range, is at present principally known for its wonderful strata of bituminous, splint and cannel Coal.

The area in West Virginia is about 17,500 square miles. Its agricultural advantages are of great importance and value, though hitherto deemed subordinate to its great mineral wealth. The improved lands in 1860 were one and a half million acres, the lands in farms, six million acres. There were over three million acres not held in farms, wild lands, generally owned in large tracts for their timber, and undeveloped minerals. Timber lands can still be had in quantities at from \$1 to \$10 per acre, according to their surface, peculiarities and proximity to the road. The average production of cereals was 33 bushels to the inhabitant, and 2 4-5 animals to the person.

The capacity of the bottom lands for corn raising is equal to that of the best bottom lands in Ohio and Indiana, to which they are analogous. Tobacco and root crops can also be raised advantageously; the tobacco being so superior, that it has taken premiums at several of the exhibitions of this crop. As a live stock country, it resembles the famous pastures of the uplands which border it on the east, and the notable "blue-grass" lands of Kentucky, which join it on the west.

Its location between the great markets of the east

and west, and within 20 hours' travel of the seaboard, and within 48 hours of New York, will enable cattle-growers to reap all the benefits of cheap feeding and economical transportation to market.

Active manufacturing and mining industries will be rapidly developed along the central portion of this belt, especially in the New River and Kanawha Valleys, on the line of the railroad, which will furnish a home market for local produce, and render this portion of the country additionally attractive to settlers and farmers.

Sumac and oak bark, largely in demand for tanning and dyeing purposes, are found here in abundance, and tanneries here would have hides and ingredinets accessible at a minimum cost.

(2.) IRON ORES.

Facilities for the Manufacture of Iron. The deposits of iron ores and the advantages for the manufacture of iron and steel upon the line of the Chesapeake and Ohio Railroad, probably, largely exceed those of any other part of the United States.

The rapid increase in the demand for iron, the development of iron manufacture in this country, and the large profits to be derived from its production at the high prices now prevailing, are imparting a great interest to those points which offer the most favorable opportunities and the greatest advantages for this important and extensive branch of industry.

There can be no doubt that the iron manufacture of the United States is destined to experience a very great and rapid development from this time forward, and that it will concentrate to a large extent in the vicinity of the superior ores, fuels, fluxes, etc., of the Allegheny region of Virginia and the Kanawha Valley, along the line of the Chesapeake and Ohio Railroad.

It is not only among the iron workers of this country that this extraordinary and attractive field, now ren-

dered accessible and available by the opening of the railroad, is attracting attention, but the capital and enterprise of Great Britain are also turning toward it. Its advantages are being explored in the interests of English capitalists, who are astonished at the wealth which their examinations are revealing, and already arrangements are in progress for the investment of large amounts of English capital in coal and iron lands, and in the manufacture of pig-iron, rails and Bessemer steel. *

* The following figures will show the Production of the several classes of Iron in the United States for a series of years :

YEAR.	ANTHRACITE.	BITUM. AND COKE.	CHARCOAL.	TOTAL.
1862	470,315	.....	186,660	787,662
1863	577,638	.....	212,005	947,600
1864	684,018	.....	241,853	1,135,497
1865	479,538	.....	262,342	931,582
1866	740,267	268,996	332,580	1,350,943
1867	798,638	218,647	344,341	1,461,626
1868	893,000	340,000	379,000	1,603,000
1869	971,150	553,341	332,150	1,916,641
1870	.....	.....	.....	1,900,000
1871	863,000	600,000	600,000	1,850,000
1872	1,197,010	712,500	712,500	2,358,250

No less than 109 *new Blast Furnaces* were in course of erection during the year, which would give an increased capacity of 327,000 tons of Pig Iron.

The *total yield of iron ore* in the United States for the year 1872 is stated at 6,421,836 tons.

The production of Iron in Great Britain in 1845 was 1,250,000 tons ; in 1850, 2,250,000 tons ; in 1864, 5,000,000 tons ; and in 1866, 4,530,051 tons ; in 1869, 5,527,443 tons.

It will be seen that the production of Pig Iron in the United States is rapidly gaining on that of Great Britain, and already exceeds that of any other country.

Of the product of 1872, according to the *Philadelphia Ledger*, a careful authority, considerably more than half, 2,678,500 tons was required for Railroad Iron ; miscellaneous castings, 600,000 tons ; stores, 250,000 tons ; nails, &c., 250,000 nuts and bolts, 250,000 tons ; the remainder being allotted to architectural, agricultural, gas and water pipes, ship-building, machines, &c. Of Bessemer Steel there were 125,361 tons manufactured.

The total requirement for railroads per annum is now 2,478,500 tons, or more than the total production in the U. S. The railway consumption is distributed per mile as follows : For Rails and Track, per mile, 100 tons ; for Locomotives, 25 tons ; for Cars, 20 tons ; for Sundries, 5 tons ; total, 150 tons, per mile.

Iron ores of several of the most valuable varieties are found in great abundance in seams of unusual thickness, and of very rich qualities, along the line of the road. From a point on the road, 56 miles west of Richmond, to the western terminus on the Ohio river, a distance of 370 miles, iron ores, in workable seams, are found at frequent intervals, many of which have been long worked on a moderate scale, with charcoal for fuel, and the great richness of which has long been known.

The means of transportation, and the communication with the cheap and abundant coals of the Kanawha, which are peculiarly adapted for use in the manufacture of iron, now afforded by the opening of the railroad, make these ores available for a vast production on the spot, as well as for use in the furnaces of southern Ohio and at other points, where they will be wanted in large quantities, to take the place of ores hitherto obtained at large expense from Lake Superior and Missouri.

The ores consist of magnetic, argillaceous, brown hematite, fossiliferous, specular and other varieties, and are disposed in immense masses, much more accessible and of greater dimensions, than the same seams found in the corresponding stratification in Pennsylvania and New Jersey.

First in the order of workable seams in proceeding westwardly, is a rich hematite ore, yielding about 40 per cent. of metallic iron, found not far from Tolersville Station. It is now mined and smelted at the Victoria Furnace, near the railroad. Further West in the same Piedmont region there are evidences of a magnetic ore of the best quality, identical in position with the magnetic iron ore-belt in New Jersey, from which in 1867, 115 mines furnished 1,300,000 tons of iron ore. The introduction of cheap coal to this region will quickly develop the mining of this

deposit. It is of recognized value for mixing with other ores found on either side of it. Limestone is found east of it in Louisa County, and west of it in the Shenandoah Valley.

A third seam of hematite ores is found in Silurian form, in the spurs of the Blue Ridge, near Fishersville, in the same geological position as the ores so extensively worked in the Cumberland, Reading, and Lehigh Valleys of Pennsylvania.

Rich lodes of hematite and specular ores are found running along the foot of the Blue Ridge, and at intervals, in the whole breadth of the Shenandoah Valley, and in continuous seams of great thickness along the north and parallel mountains beyond. In the south-western part of the Valley, where the Radford Iron Company of Philadelphia have erected a furnace, these lodes measure 35 to 40 feet in thickness. This ore is of great purity and value, as is shown by the results of actual working; one of the furnaces in the vicinity having turned out from the run of a season 56 per cent. of the metal.

In the foot slopes of the North Mountain, also, are numerous lodes or pockets of ore inter-stratified with the limestones, some of them quite extensive, and from many of them ores will be in demand for mixing with the harder ores from the adjacent mountains.

The astonishing magnitude of the ore beds in the Western portion of Augusta County and adjoining Counties is such as to give them the designation of "Cliff" or "Bluff" ores. Trustworthy experts and mining engineers of great experience unite in saying that their mass, and position near the surface, are such, as have not been found in any other portion of the globe, so far as is known to commerce.

Prof. Ridgway, who devoted some time to a careful examination of these ores, says in his report:

"This Bluff iron ore, of the Oriskany sandstones,

"shows itself near to the Buffalo Gap Furnace [see Map "No. V] also along the same line of outcroppings, at a "point one mile from the Elizabeth Furnace Station [see "No. VI.], where immense cliffs of this ore may be seen ; "also near Pond Gap Station [see No. VII]. Again, in "like manner, in the parallel hills, at the Esteline Furnace "see No. VIII] ; and again, at the California Furnace [see "No. IX], where there is an immense amount of iron ore "reposing, at a low angle from the horizon, in a stratified "form, and in good mining condition. Again, at the Australia [see No. X] and at the Lucy Selina [see No. XI.], "the beds of ore are of remarkable extent and in vast "masses. The immensity of the aggregate mass of hematite iron ore at these points surpasses anything which I "have ever seen elsewhere. The ore rises up into huge "cliffs from 50 to 75 feet high, and the cliffs may be broken "down and put into the cars at \$1.40 per ton, including "royalty."*

It is asserted that the stratum extends for over 300 miles in Virginia, and in the opinion of iron masters it is destined to become the seat of the most extensive iron manufacture, the cost of mining the ores, of bringing together fuel and flux being less than in Pennsylvania or elsewhere on this Continent. Large shipments of ores can also be advantageously made to furnaces located near the seaboard in the Northern States, and in Southern Ohio.†

Limestone is found of great purity, and in great abundance in the valleys separating these successive ore-bearing hills. In the Valley of Virginia it is in close proximity to the ore beds ; again in the Greenbrier Valley it is bordered by deposits of ore on the one side, and by the coal measures on the other side, so that there is scarcely an interval of a hundred miles on the entire road which has not both iron ore and limestone ; while the ore is also found on both flanks of the coal.

*Analyses of the Bluff ores of Augusta County, by T. Heinrich show 51.33 and 58.32 per cent of metallic iron respectively.

† Parties seeking information in regard to tracts of coal and iron lands held for sale, or concerning the facilities for mining and iron manufacture, can consult Mr. Pliny Fisk, a Director of the Chesapeake & Ohio Railroad Company, who has devoted considerable attention to these subjects the Company's behalf. whose address is—Trenton, N.J.

The main ridge of the Alleghanies, and the spurs and parallel ranges on the water shed of the Ohio, all or nearly all, have seams of iron and other ores. These had been explored to a limited extent only, prior to the opening of the railroad, as there was then no outlet to market. Quite recently, however, more extended examinations have been made, resulting in the location of valuable iron ore beds which will probably soon be put to use. Between White Sulphur Springs and Huntington are numerous sites for the economical manufacture of iron, from either the native ores, or in combination with the ores from the Eastern slope of the mountains.

The controlling elements in the successful production of iron, are the cost of the several ingredients, and the cost of sending the manufactured product to the principal distributing centres. Labor, interest, wear-and-tear, contingent expenses, and the like, are about the same in different localities. The accessibility, adaptability, and abundance of coals, ores and limestone along the line of this road ensures cheap pig-iron; and cheap pig and cheap fuel, ensure cheap wrought iron and steel. The railroad furnishes a cheap outlet to the markets of the Atlantic, and also to the west which must always consume immense quantities of all descriptions of iron. The furnaces situated along the eastern portion of the line are all in prosperous operation, most of them enlarging their capacity. They have long produced charcoal pig so cheaply as to compete with the world, even though using high priced fuel. Now that cheaper fuel and fluxing material can be had by the railroad, they will be able to furnish the ordinary pig metal at the seaboard, on terms which will compete with European or other domestic furnaces at a large profit to the manufacturers.

For furnaces located on the western portion of the line, the Western States will afford an excellent market. The same vessels bearing eastward the products of the far west, can be freighted back on their return trips with the coal and iron of the Kanawha.

Mr. Howell Fisher shows, by calculations of the cost of the several items at the furnace, how the Kanawha region may reap a decided advantage in the manufacture of either the crude metal or its more finished products, and adds :

“Pittsburg was formerly the cheapest point in the West for the manufacture of finished iron, and while Cincinnati will be a somewhat cheaper point of delivery from the Chesapeake and Ohio Railroad than from Pittsburg, it will be fair to treat delivery from these points to the general Western market as equal.

“It will not be necessary, in making the comparisons, to go into the minutiae of manufacture, as labor, contingent expenses, interest, &c., vary but little at all points, final results as to cost being a question of the cost of ore and coal.

“The point on the line of the Chesapeake and Ohio Railroad assumed will be that where the first available coal is found.

“At Pittsburg the question of ores enters more materially into the difference of cost. The cost now at Pittsburg for ore necessary to make one ton of pig-iron is not less than \$15, and at the estimate before assumed of 1.43 tons of pig-iron to one ton of rail, this would give \$21.45 as the cost of ore per ton of finished rail. On the Chesapeake and Ohio Railroad \$12 per ton of pig-iron for the ore will be admitted to be a high figure. This would give \$17.16 per ton of rail—over \$4 per ton advantage. The Pittsburg coal has, however, to be coked, and to this item is, therefore, to be added one and a half tons of coal and the cost of coking, so that there is, under the most favorable statement, to Pittsburg a difference of \$6 per ton in favor of the Virginia location.

“As articles of iron require more work, such as locomotives, steam-mills, finished iron work of all descriptions, the manufacture of steel, etc., so do they represent more coal per ton of finished work, and can be manufactured proportionably cheaper, as fuel is cheaper.

“In Pennsylvania the manufacture of charcoal iron is gradually dying out, owing to the want of proximity of the wood and ore. This proximity still exists over a large field of country in Virginia, and is transferring the manufacture of charcoal iron to that State. This article is essential to the production of good car wheels and the manufacture of Bessemer steel, and is now transported to Pennsylvania, to be there used for these purposes, and worked up by a dear fuel. The laws of trade will only permit this so long as this iron cannot meet its natural ally, the coal of Virginia. When this occurs, and rolling mills have been erected to make the necessary axles and bar iron, and all brought into connection with the cheap and superior lumber of the coal region, the industry of freight and heavy car construction will be driven to seek the line of this road, and it will not be five years from its completion before four-fifths of this class of cars in the United States can be here manufactured.”

Professor Jed Hotchkiss, who is familiar, from the explorations of many years with this part of the country, also speaks in his “Resources of Virginia,” more particularly of its advantages for iron making :

“The mineral wealth of the Blue Ridge is great, and destined to be quite important, from its nearness to the sea-board. In the ranges of foot hills, lying along the western base of these mountains, the whole 300 or more miles of their length, are found very extensive deposits of brown hematite iron ores of the best character, giving from sixty to seventy-five per cent. of metallic iron in the yield of the furnace. It is not correct to say that these deposits are continuous, and yet they have been so regularly found, when sought after, as almost to justify the use of that term. In some places they are deeply buried in the *debris* of the mountain; at others they show themselves as interstratified masses, conforming for long distances to the formations of the district, as near where New River leaves the Ridge, at Radford Furnace, where the stratum is over thirty feet in thickness, while at other places the ore, in a soft state, forms hill-like masses, as at the Shenandoah Ironworks, in Rockingham. At one place in Rockbridge, where the stratification is nearly vertical, striking with the mountain, this one appears as a hard central stratum; forming the crest of a spur more than 600 feet above its base. The western flank of the table-land in the south-west is known as the Iron Mountain from the quantity of this ore there exposed. There are numerous furnaces now in blast and others are being built along the line of these deposits making charcoal iron of a high character such as now readily commands sixty dollars a ton in the United States using the timber of the Blue Ridge for fuel. One of these had a yield of sixty-five per cent. of iron from the ore put into the furnace in the run of a season.

.. Between these hematite ores and the main ridge is found a massive and somewhat persistent deposit of specular ironstone yielding from twenty to thirty per cent. of metallic iron. This had not attracted any attention until lately when it has been advantageously used mixed with the richer hematites as at Mount Torrey furnace in Augusta.”

(3.) COAL DEPOSITS.

Bituminous, Splint, and Cannel. For a hundred miles of its course the Chesapeake and Ohio Railroad passes through and over the great Allegheny coal-field, at the point of its greatest width, where the workable strata are most numerous, where the seams are of the greatest thickness, the varieties of the coal the most important and valuable, and the quality of the coal the purest.

The coal measures of West Virginia cover nearly 16,000 square miles. In the New River and Kanawha Valleys the coal beds make their appearance at the surface, to the number of 14 distinct strata, with an aggregate thickness, at places,

of 100 feet, of which more than half is in workable seams of from 3 to 8 feet in thickness. By the erosion of the streams the coal seams crop out on the hill sides high above the water and railroad levels, in the most favorable position for easy, cheap, and safe excavation. The cost of opening mines is small, and as the ventilation and drainage are natural, the cost of bringing coal to the surface must always be cheaper than in any other coal-fields in the world.

Mr. Howell Fisher furnishes more specific information on this point. He says :

“In respect to conditions most essential to cheap and profitable working, this region stands unrivalled. It has been stated before that the chasm of the river renders it most peculiar service in its relation to the coal. Cutting all the coal strata for nearly its whole length entirely through, and getting down among the shales under the coal, the river has caused the numerous streams which pierce this whole coal region to cut down through most of the coal-bearing strata on their courses, leaving the coal entirely above water level, accessible at hundreds of points by simply scraping off the surface soil ; so that so far as the mere getting of coal is concerned, two thousand dollars will open a mine ready to ship one thousand tons per week. There is no region in the world where less physical labor will prepare a mine for the delivery of coal at the drift's mouth.

“This will be made clearer by a comparison of the position of coal here and in Great Britain in this respect. In Great Britain, and in fact in most all of the European coal-fields, the coal is deep below the water-level. To reach the seams requires the expenditure of years of labor and vast sums of money in sinking shafts or pits, and in erecting pumping and hoisting machinery, to be maintained and renewed at heavy annual expense. It is authoritatively stated, that the cost of sinking shafts in the Newcastle region of England to the depth of one thousand feet, has been, in many instances, one thousand dollars per yard. In the great Northern coal-field of Great Britain, producing twenty million tons per annum, there are two hundred pits or shafts, costing, in first outlay, for sinking and machinery, fifty millions of dollars, to which must be added the necessary expense of constructing and maintaining proper air-courses, and their accessories requisite to the safety of the employes.

“There is now invested simply in pits, and machinery for pumping and hoisting the one hundred million tons produced in Great Britain, two hundred million dollars; and this vast sum is destined to utter destruction in serving the purposes for which it was used.

“These pits and machinery being constructed, they involve a certain amount of labor for every ton of coal got, in addition to their cost and renewal.

“Now, in this great coal-field crossed by the *Chesapeake and Ohio Railroad*, Nature has already sunk all the necessary pits and shafts, which need neither repair, renewal, or labor to work them. The laws of gravity have provided the most perfect, permanent, and costless pumping machinery; and the most perfect ventilation of the mine and safety of the employes, instead of requiring scientific knowledge and anxious thought, is simply a matter of the most ordinary care, the almost perfect freedom from noxious gases being the natural result of the position of the coal strata.”

The principal varieties are the *Bituminous*, the *Splint*, and the *Cannel*. Of the bituminous, there are seams of different degrees of hardness and texture, from the friable or “fatty” coking coal, similar to the best of the Newcastle (England) coals, to the harder “block” coals with regular cleavage, similar to the Youghiogeny coals so largely in demand in the western and southern cities. For household purposes, for fuel and for the manufacture of gas, the Kanawha bituminous coals, are equal to the best Pittsburg, or Cumberland coals.

The *Splint Coal* of the Kanawha is a hard close-grained dry burning variety, peculiar to this region, and is usually found here in conjunction with the seams of bituminous or cannel.

Its distinctive features are a square, regular cleavage, and great purity, being nearly free from sulphur and earthy matter. It is also found to have great sustaining strength in the furnace-stack, which, together with its great purity, make it more valuable for the manufacture of iron, than any other mineral fuel discovered, as it can be used in its raw state, without coking.

It makes a black, soft, malleable iron, which ranks in

quality and price with "No. 1 Foundry," or the best quality of Charcoal iron.

The presence of this valuable coal in such quantities, and in such position that it can be mined very cheaply, is of incalculable importance in connection with the iron ores of Virginia, and to the furnaces in Southern Ohio and Kentucky.

Several tracts of coal lands have recently been purchased by Pennsylvania and New York capitalists and iron masters, with a view to the erection of furnaces near the coal mines to be supplied with ores from the rich deposits of the Alleghany region already described.

Splint Coal of a very fine quality is now being mined and shipped over the Railroad to the East and West, by the *Kanawha and Ohio Coal Co.*, whose mines are located at Coalburg, 16 miles above Charleston, directly upon the line of the Railroad, their incline for the delivery of the coal from the mouth of the opening, coming down the hill side to the track. The officers of the Company are Wm. H. Edwards, President, and Jno. H. Platt, Secretary. They may be addressed for fuller particulars at Coalburg, West Virginia, or No. 40 Wall street, New York City. Their Splint Coal is used in the manufacture of iron, which sells at Cincinnati at the full price of the best Charcoal iron.

The *Cannel Coal* is found in great abundance, directly upon and within easy reach of the line of the Railroad, at different points throughout the Kanawha Valley, in seams of from $2\frac{1}{2}$ to 8 feet in thickness, and of great purity.

It is equal to the best imported cannel for family use in grates, and is found by actual test to possess very great value for use in the manufacture of illuminating gas. The Manhattan and the Metropolitan Gas-Light Companies of this City, and others, have made satisfactory tests of its qualities for this purpose, and found it superior to most other coals in use, both in the quantity as well as in the purity and illuminating power of the gas which it yields.

It will be wanted in large quantities by the Gas Companies throughout the Eastern and Western States, wherever it becomes known, and the demand for it for this purpose, and for fuel, will call for a very large product, and render the mining of it one of the most important and profitable industries on the line of the Chesapeake and Ohio Railroad, to which it will yield a very large tonnage, and a remunerative price for transportation.

The *Peytona Coal Company*, whose mines are located on the Coal River, and whose principal office is at No. 58 Broadway, in this city, and the *Cannelton Coal Company*, whose mines are at Cannelton, 26 miles above Charleston; and in sight of the Railroad, and whose principal office is in Philadelphia, are now mining, and shipping over the Railroad in both directions, very fine qualities of Cannel Coal, further particulars of which may be obtained by addressing them as above.

Other parties are preparing for the mining and shipping of Cannel Coal in large quantities.

The price of imported Cannel Coal in this market for some years past has ranged from \$18 to \$22.

The Cannel Coal of the Kanawha region, which has hitherto been unavailable for want of the means of transportation to market, can now by means of the Chesapeake and Ohio Railroad, be delivered here at from \$10 to \$12 per ton, and pay a good profit to the miner, and can be supplied to the cities and towns along the Ohio and Mississippi Rivers, and vicinity, at still lower rates.

Coal Lands containing valuable seams of Cannel may still be had by purchase or lease on favorable terms, and mines may be opened and prepared for the delivery of coal, in a short time, and at very moderate expense.

The following citations from the most reliable authorities and experts, on the Kanawha coal field, furnish facts of great interest :

The work "Coal, Iron, and Oil," by Daddow & Bannan, Edition of 1866, page 340, speaking of this location and its coal, says : "Coal river,

“Elk river, and Gauley diverge from the Great Kanawha and spread their branches over one of the *richest* and most *magnificent coal regions* in the world, and bring down their wealth to one common centre on the Great Kanawha. The coals of this region generally are *better, purer, and more available* for all the requirements of trade and manufacture than the coal from any other portion of the Alleghany coal-field. The seams of coal are more numerous and their thickness greater than in any other portion of this coal-field; it can be *mined cheaper* and with more economy generally, under the same rates of labor, *than in any other region in this country without exception.*”*

Prof. Hotchkiss, in his Paper read before the Society of Arts, on the Resources of Virginia, says :

“The mineral resources of the Trans-Appalachian region are very great. Especially is it rich in the abundance of cannel, splint and bituminous coals, one or more of these varieties being found under 16,000 square miles of its territory. The great Appalachian coal-fields extend from northern Pennsylvania to northern Alabama, an irregular oval area, widest on the line of the Kanawha river, which crosses it at right angles. This part of the coal field is one-quarter larger than the great coal fields of the British Isles.

“On the eastern border the seams of the lower coal measures are found, having an exposed aggregate thickness of some 50 feet in the gorge of New River—the line of the Chesapeake and Ohio Railway—a cañon from 1,200 to 1,500 feet below the general level of the country. One of these seams is over six feet thick, furnishing a good coking coal; another seam of block coal is four and a-half feet thick. There are several other seams three and four feet in thickness, furnishing bituminous coals of good quality. These seams have only a moderate inclination to the north-west, and are all above the river and railroad level. These lower measures descend more rapidly than the rivers, and so pass beneath the water level some 50 miles from their eastern outcrop. The strata of the upper coals come to the horizon as the mouth of New River is approached, and not far below the junction of that river with the Gauley to form the Great Kanawha. At Armstrong’s Creek, a section in the 600 feet of bluff above the level of the Kanawha, shows 13 seams of coal varying in thickness from two and a-half to nine feet, with an aggregate of 61 feet. Below this place, at Cannelton, on the other side of the Kanawha, there are five seams of coal open, in the 1,300 feet of the face of the bluff, aggregating 29 feet. More than 100 feet of stratified coal has been proved

*For further particulars of the stratification, dimensions and value of the seams, see the work “Coal, Iron, Oil,” Philadelphia, J. B. Lippincott & Co.

“here. The seams vary from 8 to 14 feet in thickness, and embrace gas, “shop, splint, and cannel varieties. The seam producing the cannel is “double, giving 4 feet of cannel and $2\frac{1}{2}$ of splint coal. This cannel will “yield 60 gallons of oil to the ton of 2,000 lbs. A section on Cabin Creek “and vicinity, ten miles below Cannelton, by Prof. Ansted, gives 68 feet “of coal, in some 13 seams, varying from $2\frac{1}{2}$ to 11 feet; 22 feet of these “seams are cannel and from 7 to 11 splint coal. At Campbell’s Creek, “still lower down the river, in the 400 feet of bluff, are 6 seams, from $4\frac{1}{2}$ “to 6 feet thick, that furnish 29 feet of coal. This coal is peculiar in its “formation. Near Clay Court-house, on Elk river, the coal strata are “from $4\frac{1}{2}$ to 11 feet thick, making 41 feet of coal in the 500 feet of bluff; “19 feet of the coal being splint and 6 cannel. At the mouth of Coal- “river a stratum of coal, from 4 to 8 feet thick, is found at a depth of 300 “feet; of course the other seams are found there also, but at greater “depths. These may be considered fair samples of the sections through- “out this great coal-field, ample enough to satisfy the wants of untold “generations, and so accessible as to require no special skill in mining; “nor expenditure for drainage and ventilation. The Baltimore and Ohio “Railway, with its Parkersburg and Wheeling arms and numerous “branches, now crosses the northern part of this field and opens it to “markets. The Chesapeake and Ohio Railway has just crossed it in the “south, where the Great Miner has “torn asunder the mountains,” and “well and wisely cut an open gangway, more than a thousand feet deep, “across the rich strata, exposed them to daylight, and at the same time “made way for the railroad, at very low grades, to carry this “bottled “sunshine” to the great markets. The coals found here are used in mak- “ing iron without coking, and the choice for any special purpose is very “great, the quality being unexceptionally good.”

Prof. T. S. Ridgway, has made a full and careful examination of the minerals of commerce along the line of the road. The concluding summary of his Report,* in relation to coal and iron ores, is as follows :

MAGNITUDE OF THE DEPOSITS.

“The lower coal measures, which I have just described in detail, are “comprised in twenty-four seams, eleven of which—containing an *aggre- “gate thickness of fifty-one feet*—are workable. The pick and shovel may “disclose new beds in addition.

* Copies of this Report, with Geological Map, may be had on application at the office of the CHESAPEAKE & OHIO R. R. Co., 54 William street, or at the Banking House of FISK & HATCH, 5 Nassau Street, N. Y.

“Any attempt to estimate, by calculation, the amount of coal contained within a given number of miles of your road would be futile. Without deeming it necessary to resort to a trigonometrical survey of even a small portion of the field, it is quite obvious, even to the practised miner, that there are above the water-level, between Big Sewell Mountain and Charleston, within five miles on either side of the line on your road, thousands of millions of tons. The same seams could, of course, be reached by pits of moderate depth, between Charleston and Huntington ; and the amount of coal available from West Virginia is incalculably large—sufficient, allowing for a normal ratio of increase in consumption, to supply the Western markets for a thousand years to come.

ADVANTAGES FOR IRON AND STEEL MANUFACTURE.

“Reviewing the ground between a point in the Piedmont District of Virginia, say Gordonsville, and the point where your line debouches on the Ohio, Huntington, a distance of 325 miles, as traversed by your road, I find an almost constant succession of the minerals prominently used in the mechanic arts and commerce ; and I am convinced, from the way in which they are presented at the surface, from their abundance and variety, and from their proximity to, and elevation above, the road, that all the elements of successful, continuous, and profitable coal mining and manufacture are here found closely associated, and under the most favorable conditions for use. The iron ores are especially rich, of great variety ; the carboniferous limestone is especially superior for fluxing purposes ; the several kinds of coal are, in their several ways, specially adapted for the manufacture, refining and working in iron and steel ; and I am decidedly of the opinion that both the crude metal, and its more finished products, may be produced along this portion of your road at less cost, or, in other words, so as to yield a larger profit, than in even the most favored localities in other States. Having heretofore investigated and reported upon various furnaces, and having in view the cheapness of coal and charcoal, fuel, labor in Virginia (colored), and the resources of water power, I am satisfied that pig iron can be made at numerous points along the road at from \$18 to \$20 per ton.

“The fact that good serviceable coal can be placed in your cars at \$1 per ton, exclusive of royalty, is one of the first importance, both to the workers in iron, and to the immense distribution of coal for various uses throughout the Mississippi Valley. It will be observed also that, unlike most railroads, by the establishment of iron-works between these extreme points, a reciprocity of freights would follow, the cars passing one way loaded with coal, and the other with ores. The light grades of your line will not only admit of this interchange, but also enable you to distribute the minerals to the works along the line at less cost, and also add to the net revenues of the Company. Finally, there is no better

“outlet for coal and manufactured iron and other products to the Mississippi Valley on the one hand, by means of the 12,000 miles of internal navigation, added to the vast network of railroads with which the Chesapeake and Ohio Stem Line is destined to be connected; or, on the other hand, to the Seaboard Cities by way of the cheap coast navigation which your line reaches at its eastern terminus on the Chesapeake Bay.”

The following remarks by Professor Ansted, F.R.S., and others, made during a session of the Society of Arts in London, gives concurrent testimony to the very great value and importance of the Virginia coal and iron deposits:

“Professor Ansted, F.R.S., said it was nearly twenty years since he first visited Virginia, and examined some of its mineral riches. * * He could speak personally and positively as to the nature of the coal fields alluded to, which provided one of the greatest resources of mineral wealth of Virginia, and one which would no doubt prove in the long run the most important of all. They might form a good notion of the real value of this coal field by drawing a comparison between Virginia and England, two countries of nearly the same size. In Virginia the coal fields extended across the country from north-east to south-west—as if two-thirds of England were one coal field—the coal not being difficult to work, involving very few mechanical difficulties with water, and scarcely any danger from explosions. The communications by railway were quite equal to those of England. It was true the coal fields did not come actually to the coast, but they reached almost to the Ohio and the Mississippi, and he felt sure that the Mississippi itself would ultimately be as great a highway for America as the Atlantic was for England. There being easy communication with the Atlantic coast, he did not think it was too much to expect that in course of time Virginia would send over coals to England if the labor question remained as it then existed. At the present time they exported coal largely from Newcastle, from the neighborhood of England and South Wales, and he saw no reason why some of the great Appalachian coal fields should not export coal with equal convenience to England as we did to New York. For a very long time past the whole of the gas burnt in New York had been made of English coal, notwithstanding the facility they had for getting it from their own country; but if the price increased much more they would have to use their own. As to the existence of coal in Virginia there could be no question, but it had never been properly worked; indeed, there was no coal field which was more important, and, although there were places where the seams were thicker, there were none where they were more accessible or of a better quality; and he did not think it was always the case that the thickest seams were the most valuable. The coal fields in the Appalachian range were nearly all horizontal, in-

"tersected by convenient valleys, and could be worked from numerous
 "points at the same time with ease, and might be looked upon as inex-
 "haustible. * * * * * Virginia was also rich in iron fields of every variety
 "and quality, and he saw no reason whatever why, if the same amount of
 "energy and intelligence were applied to the manufacture of iron as in
 "England, Virginia should not take precedence, in the present state of
 "the labor market, in that important manufacture. Something of this
 "kind must inevitably take place, unless things were altered, of which he
 "saw no chance; and in this respect Virginia had the chance of being one
 "of the most important States of America, and one of the wealthiest
 "countries in the world: for, although up to a comparatively recent time
 "it had been neglected, there was no reason for it so far as the physical
 "condition of the country was concerned. No country had greater re-
 "sources of wealth; for besides coal and iron there were other minerals,
 "gold having been obtained in many districts with advantage, and it was
 "certainly not yet exhausted. There were also copper, limestone, marble,
 "salt and other earthy minerals, which he would not allude to. With all
 "these advantages, he looked forward to Virginia being one of the coun-
 "tries of the future, and he was happy in being able to lend what assist-
 "ance he could in pointing out these matters, because he had visited it at
 "a time when it was much less populous than it was now, and had fore-
 "seen that when the coal was worked it must rise in importance."

"Mr. J. Bowron (Newcastle) said that two years ago he spent some
 "months in Virginia, more particularly for the purpose of investigating
 "its mineral resources, and he could concur in all the remarks of Profes-
 "sor Ansted. There was no doubt of the regularity of the coal fields
 "throughout the whole of Western Virginia, while the country was so in-
 "tersected with valleys that it was very easy indeed to open up at any
 "point coal seams which could be readily identified with the same seams
 "occurring twenty or thirty miles off. He himself followed one seam a
 "long distance, and its regularity he could hardly have believed if he had
 "not traced it. On approaching the Appalachian region he found such
 "immense deposits of hydrated hematite ore as he had never seen else-
 "where, though he was familiar with deposits of a similar kind in Cum-
 "berland and also in Spain. Besides these resources the capability of
 "Virginia as a paper producing country were greater than he believed
 "existed anywhere else. It had the materials at hand for producing those
 "chemicals for which, at present, America depended mainly on England,
 "being well supplied with metallic sulphurets, salt, limestone possessing
 "ninety-eight per cent. of carbonate of lime, manganese, pure water and
 "coal, and having these, it could not lack anything for chemical manufac-
 "tures; and it possessed besides such a growth of non-resinous trees and
 "plants, suitable for the manufacture of paper, that he had no hesitation
 "in saying that the one State alone could easily supply paper for the
 "whole of the civilized world."

“Mr. Newton said he had twice recently visited Virginia and Western Virginia, for the purpose of ascertaining its suitability as a colony for English agriculturists. He found that the land was richer than in England, and the climate better ; land could be bought for little more than one year’s rent in this country ; every crop that would grow here might be cultivated there, and some especial ones besides ; there were as good markets, and every necessary could be obtained at a lower price. In fact, all that an English farmer wanted was a little capital to start with, and he could not fail of doing well there.”

“Mr. Etheridge, F.R.S., referring to the recent statement of Sir William Armstrong, that under the present prices of coal England was paying what was equivalent to an annual tax of £45,000,000 on that article, drew special attention to the rich mineral resources of Virginia, and expressed his opinion that unless some solution of the difficulty could be found at home—and there was no absolute necessity for such famine prices, seeing that at the present rate of consumption our own coal fields would not be exhausted in less than 500 years—Virginia would, at no distant date, be found supplying the whole world with coal and iron.”

There have been shipped to the cities along the Ohio and Lower Mississippi Valleys, upwards of 3,220,000 tons of coal per annum from the streams above Pittsburg, distances of 500 to 1,500 miles ; of which the 315 miles between Pittsburg and Huntington comprise by far the most hazardous, tedious and costly portion. It is reasonable to expect that hereafter a large part of this supply will be drawn from the Kanawha, as this region is, without doubt, by far the most favorable and profitable locality for the mining of coal for the western markets.*

* *Movement.* The total production of Coal in the United States for 1870, is estimated at 34,600,461 tons ; of which 19,211,313 tons were Anthracite, and 15,589,148 were Bituminous. Of the Anthracite, 15,368,437 tons were sent by railroad or canal to market, and 3,842,876 tons consumed near the mines. The amount of Bituminous sent eastward to market was 4,589,148 tons ; the balance, 10,800,000 tons, being mined and consumed in the United States, principally at the West.

(4.) SALT, ROOFING-SLATES, KAOLIN, FIRE-CLAY,
CEMENT, ETC.

The Salt Wells of the Kanawha Valley are noted throughout the west for the excellence and purity of their salt.

It has been used for many years in some of the largest meat packing establishments, where it is preferred to any other domestic or imported salt, for preserving purposes. The salt is produced in both coarse and fine grained varieties, suitable for the table or for pickling. For the curing of bacon, the manufacture of butter, and other preservative uses, it is unequalled; being free from the deleterious

TONNAGE OF AMERICAN BITUMINOUS COAL USED IN THE ATLANTIC SEABOARD STATES

YEAR.	W. Virginia Bituminous Coal shipped East via B. & O. R. R.	CUMBERLAND, MD.		BROAD TOP, PA.	Other Bitum- inous Coal shipped East via Penn. C. P. & Erie RR	TOTAL TONS.
		Via Balt. and O. R. R.	Via Chesap. and O. Canal	Via Penn. Cen. and P. and R. R. R.		
1842	1,708	.....	.....	.....	1,708
1843	10,082	.....	.....	.....	10,082
1844	14,890	.....	.....	.....	14,890
1845	24,653	.....	.....	.....	24,653
1846	29,795	.....	.....	.....	29,795
1847	52,940	.....	.....	.....	52,940
1848	79,571	.....	.....	.....	79,571
1849	142,449	.....	.....	.....	142,449
1850	192,806	4,042	.....	.....	196,848
1851	174,701	82,978	.....	.....	257,679
1852	268,459	65,719	.....	.....	334,178
1853	376,219	157,760	.....	.....	533,979
1854	503,836	155,845	.....	.....	659,681
1855	478,486	183,786	.....	.....	662,262
1856	502,330	204,120	42,000	.....	748,450
1857	465,912	116,574	78,813	247,491	908,790
1858	395,405	254,251	105,478	201,795	956,929
1859	426,512	297,842	130,595	209,007	1,063,956
1860	493,031	295,878	186,903	497,549	1,473,316
1861*	172,075	97,599	272,625	346,289	890,588
1862*	218,950	98,684	333,606	640,684	1,291,924
1863	531,553	216,792	305,678	602,829	1,656,852
1864	399,354	258,642	386,645	667,157	1,711,798
1865	560,203	343,202	315,996	769,755	1,989,247
1866	736,153	343,178	265,720	1,137,881	2,482,932
1867	735,669	458,153	244,412	1,349,869	2,788,103
1868	165,972	848,118	482,325	280,936	1,531,304	3,308,655
1869	269,158	1,230,518	652,151	360,778	1,721,375	4,233,980
1870	248,879	1,112,938	604,137	313,425	1,889,097	4,168,476
1871	1,494,814	850,339	.....	.....	.....
1872	1,517,747	816,103	.....	.....	.....

sulphate of lime common to much of the salt sold in our markets. Its taste is pure, pleasant and pungent.

The brine of the Kanawha salines contains a bushel of salt to 45 gallons of brine, nearly double the strength of the Onondaga salt springs, from which a large part of the domestic salt is manufactured, the coal for fuel being drawn from Pennsylvania.

The evaporating pans in the Kanawha salt works are heated by coal dug from the hills on the same estate, and the salt is produced at a cost which leaves a good profit to the manufacturer. The cheapest and best packages for salt are barrels, whether for handling or for shelter, the wood for which may also be found on the same lands with the salt and coal. Transportation to either eastern or western markets is now regular and cheap, and the demand for Kanawha salt must increase largely.

The opening of the Chesapeake and Ohio Railroad, brings this salt within reach of the eastern markets, where it has been but little known, heretofore, owing to the absence of available means of transportation, and it is now being shipped to Richmond for distribution to South Atlantic and Eastern points, where it must supercede, to a large extent, the imported article.

Bromine, which is largely in use in the arts, for bleaching, is made from the waste of the salt manufacture. This, as well as soda-ash, and other chemicals of which salt is the base,* now imported, can be produced in immense quantities in the valley.

The present product of the Kanawha salt wells is in the vicinity of 2,000,000 bushels per annum, of which the "Snow Hill Salt Furnace Co.," produce upward of 500,000 bushels.

Further up the New River, and not far from its confluence with the Greenbrier, are salt works which were kept in operation some years ago, notwithstanding the cost and difficulty of getting the salt to market. The advent of the

* The importations of soda-ash and kindred salts of soda, exceed 200,000,000 pounds annually.

railroad should bring these Salines within the limits of profitable working and good markets. On the banks of the New River above the Greenbrier, are also Salt Springs from which a limited quantity is sent to market, whose product can now be largely increased.

Roofing-slates.—Near Keswick Station is a slate quarry, from which large quantities have been taken for roofing purposes. It is of a soft nature, and some bands of it would be well adapted to working up into ornamental works of art. The consumption of roofing slate at the West is increasing, and most of it is hauled from the Eastern States.

Kaolin.—In Augusta County, on the waters of South River, about seven miles from Staunton, is a large bed of Kaolin, which was formerly manufactured into earthenware.

Hydraulic Cement.—Not far from Swoop's Station is a band of hydraulic cement limestone, of good quality, as demonstrated by actual test. It is already shipped and used for cementing purposes.

Again, on Dunlop's Creek, west of Covington, bands of the encrinal limestone are prepared and sent to market in large quantities. It is an excellent cement. Immense quantities of this material are now used in internal improvements.

Fire-clay.—Along with coal seams in the New River Valleys, are found valuable beds of Fire Clay, and Pipe Clay. Bricks made from the clay of the coal region, in combination with sand, prove to be a better fire-brick than those made from Kaolin. The introduction of new iron furnaces will call for a largely increased supply of fire-bricks, the manufacture of which affords a profitable and reliable business.

(5.) WATER POWERS, INDUSTRIAL SITES, ETC.

A line like that of the Chesapeake and Ohio, ascending 2,000 feet in the first 200 miles of its course, and descending nearly 1,000 feet in the next 150 miles, crossing and bordering on numerous streams by the way, must, of course, abound in advantageous sites for the use of water as a motive power.

At Richmond there is abundance of water-power for three or four times the present manufactures; in fact the available water power of Richmond is said to exceed the entire mill privileges of Lowell and Lawrence combined.

The flour ground at the Richmond Flouring Mills, owing to the influence of climate, is greatly preferred over other brands for export to South America and other warm latitudes, and commands a correspondingly high price. The capacity of the 68 "run" of stones of three mills is 4,080 barrels per day, sufficient to freight a large ship; or 1,224,000 barrels per annum, requiring over 6,000,000 bushels of wheat. The flour business of Richmond may be largely and advantageously increased, now that the railroad makes western wheat available in that market at a low cost for transportation.

At the head-waters of the James River, also, nearly every mountain stream can be turned to account for milling or machinery purposes. The timber from the woods can be floated to the mill by water, and by water-power sawed into merchantable lumber.

Along the New River, are numerous and effective water-powers, and advantageous mill sites, many of which can be had with the adjacent land at the bare value of the land. So of its tributaries and affluents, the Gauley, Elk, Coal and Pocatalico rivers.

No part of the country, probably, affords so fine a field for the mechanical industries in which iron, wood, coal, bleaching materials, hides, wool, or cotton are employed, as may be found along the line of the Chesapeake and Ohio railroad. The materials, the power and the markets are all accessible under very favorable conditions.

Mr. Howell Fisher, in speaking of the water-powers, says :

"Allusion should also be made to one peculiar facility incident to this river, resulting from the deep chasm cut by the waters, and which certainly can be found at but few other points. It is the use that can be so easily made of hydraulic means for the lifting and handling of heavy weights.

"To illustrate: At almost any point along the river the mountain streams can be turned into pipes with heads of (say) 300 feet, giving a pressure at the railroad level of (say) 125 pounds to the square inch. If you wish at any point to lift and handle weights of ten tons, you simply turn this water into a cylinder with a piston of eighteen inches, which will allow over thirty per cent. for friction, and it will lift the ten tons, and can be operated by any one who can turn a hydrant cock.

"At several points on New River there are natural falls, where water-power to the extent of from 5,000 to 10,000 horse-power can be had, and this power can be secured by artificial dams at almost any desired point.

"The great value of these powers can only be fairly understood when the fact is known that water-power is rated and paid for in the Middle and Eastern States at a rent of from twenty to fifty dollars per horse-power per annum, according to location.

"Even in works where not ordinarily considered desirable, water-power has been found profitable. In the manufacture of pig-iron the waste gasses have been thought to be all that could be wished as a means of power ; but on the Lehigh, above Easton, there are five furnaces, standing almost side by side, working precisely the same kind of stock ; four worked by steam, raised by the waste gasses, and one worked by water taken from the Lehigh canal, for which the owners pay a water-rent to the Canal Company, for the mere use of the water as a power, of \$3,000 per annum, rather than use the waste gasses for the purpose, and an experience of many years has shown that it is more profitable so to do.

"With this fine water power, with the great breadth of excellent wool-growing country all along it, and with a short outlet East and West, so soon as population grows to give the necessary hands, the woolen industry will spring up and thrive ; and while this location is some hundreds of miles nearer to the cotton-fields of Georgia and Alabama than the seat of many present manufactories of this article, it is to be expected that in course of time a fair proportion of this industry will also be established ; and it will not be many years before trains will be seen on the *Chesapeake and Ohio Railroad* wending their ways to the East and West, all of which—the locomotive, the cars, the freight, and the rails on which they run—have been constructed, manufactured and made on the line of road. "

THE CHESAPEAKE AND OHIO RAILROAD AS A ROUTE FOR
PLEASURE TRAVEL: ITS OBJECTS OF HISTORIC INTER-
EST AND CURIOSITY, MAGNIFICENT SCENERY, MINERAL
SPRINGS AND PLACES OF SUMMER RESORT.

The completion of the Chesapeake and Ohio Railroad from Richmond to the Ohio River opens to tourists, invalids and persons seeking rest, change and enjoyment, one of the most charming and attractive routes for pleasure travel in the United States, and affords to business men and others, having occasion to travel between the East and the West, a new and delightful route, opening to them, while pursuing their journey with speed and comfort, scenes and objects of interest not hitherto accessible, except at considerable expense of time and money devoted expressly to the purpose of visiting them.

The eastern portion of the route is thronged with historic associations and objects of national interest, and takes the traveler through and in sight of localities which have had a conspicuous place in our National History from the settlement of Jamestown and the days of Pocahontas, through the Revolutionary period, and the historic events of more recent years.

The scenery of the Blue Ridge, of the Valley of Virginia, and of the Alleghenies, is unsurpassed for beauty, grandeur and extent by anything which greets the traveler anywhere east of the Rocky Mountains. In approaching the summit of the Blue Ridge from the East in a clear day, there is afforded an unbroken view of hill, valley, tableland and cultivated fields, extending as far as the eye can reach, and of rare beauty. The passage through the great valley and the ascent of the Alleghenies afford a constant succession of objects of interest and attraction.

From Staunton to the celebrated White Sulphur Springs, the road winds among a remarkable succession of hills and valleys, the interest of which, in addition to their scenic effects, is heightened by the immense wealth of iron ores with which they are known to be filled.

West of the White Sulphur Springs the route enters a region of wonder and beauty, rendered accessible to the ordinary traveler for the first time, by the recent opening of this portion of the road; and hitherto unknown to tourists, except to a few venturesome enough to shoot the rapids of the rivers in batteaux, or ride their narrow banks on mules.

For nearly forty miles the road follows the Greenbrier River, here shut in by mountains and cliffs, and there coming suddenly upon beautiful openings and fertile bottoms, to its junction, with the more turbulent and wild New River, whose banks it then follows closely for 60 miles, to where, in its junction with the Gauley, near Hawks Nest, it becomes the Great Kanawha.

The gorge or canon of the New River affords one of the most remarkable and fascinating experiences in railroad travel, which can be found on the continent, and one which no traveler, having once enjoyed, would feel that he could afford to have missed.

It is no ordinary valley, but a literal cut, down into the bowels of the earth, whose natural surface of table land and rolling country is far above the river and the railroad from 500 to 1,000 feet; and whose geological strata of Coal, Iron and Limestone crop out on the sloping or perpendicular sides of the cut from 100 to 300 feet above the level of the track.

The road follows the natural curves of the river, which are broad, graceful and easy, down upon its banks, never losing sight of it, except when dashing for a moment through a tunnel or cut where some projecting spur of the enclosing mountains has left no bank for the road bed, or rendered the curve too sharp.

The mountains rise on either side in steep slopes or perpendicular bluffs, divided by frequent valleys and ravines coming down to the river level, and sparkling with mountain streams and waterfalls. The windings of the road, through this wonderful gorge, with the flashing river always before, behind and beside you, and the forms of the enclos-

ing hills and cliffs changing with each new curve and altered point of observation, presents a panorama which is very wonderful and thrilling—a sort of giant kaleidoscope in which vast objects are whirled about and combined in gorgeous transformations like the bits of colored glass in the child's toy.

Just below Miller's Ferry the road crosses the New River—whose right bank it has hitherto followed—in sight of the famous "Hawk's Nest." A little further down the New River and the Gauley join their waters and become the Great Kanawha, whose left bank the road now follows for 42 miles further, through the great Kanawha coal fields, past Kanawha Falls to Charleston, the capital of West Virginia, a thriving and growing city of about 6,000 inhabitants. Sixteen miles below Charleston the road leaves the river, and strikes across a rolling country to Huntington, its terminus on the Ohio.

Here, where three years ago there were only a few scattered farm-houses, is now a busy and growing city of 3,000 inhabitants, which from its favorable location on the river, its healthfulness and its unsurpassed facilities for the various industries requiring cheap iron, fuel, lumber and transportation to market, is destined to become one of the most important centers of manufacture and trade in the Ohio Valley.

MINERAL SPRINGS.

Between Staunton, in the Valley of Virginia, and the junction of the Greenbrier and New Rivers, in West Virginia, on the line of the road, and at a distance from it varying from 2 to 37 miles, is probably the most remarkable collection of Mineral and Medicinal Springs in the world. Many of them have been long known and frequented by invalids and seekers after health and pleasure, and are celebrated for their medicinal properties, and their wonderful curative effects.

The summer climate of this region of the Springs is delightful, being cool, dry and invigorating, and remark-

ably healthy. Its elevation, of about 2,000 feet above the level of the sea, exempts it from the extreme heat of Summer, and gives a purity and bracing character to the atmosphere, which is felt at once, and long remembered afterwards by those who visit it in Summer.

The most important and most widely known as a Summer resort is the celebrated Greenbrier White Sulphur, situated directly on the line of the road, six miles West of where it crosses the summit of the Alleghenies, 227 miles west from, Richmond, and 193 miles east from, Huntington. The hotel and cottages connected therewith have accommodations for about 2,000 guests, to which large additions will doubtless be made to accommodate the increased number of visitors which the opening of the road through to the west will bring to it.

There are numerous other resorts of established reputation for the medicinal properties of their waters, and for good accommodations, pleasant surroundings, and agreeable society.

Below will be found a list of the various Springs and points of interest, stage connections, distances from the railroad accommodations for guests, and names of hotel proprietors, which may be of assistance to persons proposing to visit them during the coming season.

The Mineral Springs of Virginia, though chiefly known in years past as the favorite watering place of the people of the South, have within a few years been growing in popularity with those of the North and East, especially since the opening of the Chesapeake and Ohio Railroad, from Richmond to White Sulphur, in 1869.

Until this season these Springs and places of resort, so peculiarly adapted to the wants and tastes of the people of the west and south-west, have been accessible from that direction only by long stage coach journeys. The opening of the road through to the Ohio River brings them within less than 24 hours from Cincinnati, and will make them the great watering places of the west.

Now, that they lie midway upon a great, through route of travel, between the East and West, and can be visited for a day or two at a time by thousands of people passing to and fro, and taken *en route* between the great centers of business and population on the Atlantic Coast and in the Mississippi Valley, their celebrity will be widely extended, and they will form a meeting point and social centre for people from all sections of the country, unequalled, in their natural attractions, their facilities for health, rest and pleasure, and the society which they will bring together, by any of the famous watering places of America.

DISTANCE TABLE TO THE VARIOUS SPRINGS AND POINTS OF INTEREST.

Name of Springs, &c.	County	Distance from R.R. Station.	Nearest Railroad Station.	Capacity of Accommodation.	Conveyance from Station.	Hotel Proprietors.
Augusta or Stribling Sp.	Augusta...	12	Staunton.....	500	Stage.	Chesley Kinney.
Bath Alum Springs....	Bath	10	Milboro'	200	"	Joseph Baxter.
Cold Sulphur Springs...	Rockbridge	2	Goshen.....	125	"	J. B. Goodloe.
Hot Springs.....	Bath	18	Covington	400	"	J. A. August.
Healing Springs.....	"	15	"	300	"	B. M. Quarles.
Jordan's Alum Springs..	Rockbridge	8	Goshen.....	400	"	C. B. Luck.
Natural Bridge.....	"	35	"	"	"	J. W. Bruce.
Rockbridge Alum Spr'gs	"	8	"	800	"	J. A. Frazier.
Rockbridge Baths.....	"	10	"	200	"	P. F. Brown.
Red Sulphur Springs...	Monroe....	14	Talcott.....	150	"	C. S. Peyton & Co.
Rawley Springs.....	Rockingha'	37	Staunton..	400	"	Jos. N. Woodward.
Sweet Chalybeate Spr'gs	Alleghany..	9	Alleghany Stat'n	400	"	G. L. Peyton & Co.
Sweet Springs.....	Monroe....	10	"	800	"	O. Beirne.
Salt Sulphur Springs....	"	14	Fort Spring....	200	"	C. S. Peyton & Co.
White Sulphur Springs..	Greenbrier.	0	Wh. Sul. Spr. Sta	2,000	.....	G. L. Peyton & Co.
Warm Springs.....	Bath	15	Milboro'	300	Stage.	J. L. Eubank.
Weyer's Cave.....	Augusta...	17	Staunton.....	"	"	"

STAGE CONNECTIONS

AT STAUNTON, FOR WEYER'S CAVE, AUGUSTA OR STRIBLING SPRINGS, AND RAWLEY SPRINGS.

AT GOSHEN FOR LEXINGTON, ROCKBRIDGE BATHS, NATURAL BRIDGE, COLD SULPHUR SPRINGS, ROCKBRIDGE ALUM SPRINGS, AND JORDAN'S ALUM SPRINGS.

AT MILBORO' FOR BATH ALUM SPRINGS AND WARM SPRINGS.

AT MILBORO OR COVINGTON FOR HEALING SPRINGS AND HOT SPRINGS.

AT ALLEGHANY FOR SWEET SPRINGS AND SWEET CHALYBEATE SPRINGS.

AT FORT SPRING FOR SALT SULPHUR SPRINGS.

AT TALCOTT FOR RED SULPHUR SPRINGS.

The foregoing statements are designed more especially to point out to parties seeking such information, the advantages of the Chesapeake and Ohio Railroad for the regular and economical transportation of through freights; the varied and wonderful resources with which its route is enriched, and its unequalled attractions for travel, settlement, business enterprise and the investment of capital, and to direct them to reliable sources of more particular and detailed information.

They exhibit also the great value and importance of the railroad itself, and present the most satisfactory evidence as to the very large and profitable traffic which it must command, the ample security of its Mortgage Bonds, and the prospective value of its Capital Stock.

We take great pleasure in repeating to those who as holders of its securities are interested in its financial success and prosperity, the expression of our continued belief, strengthened and confirmed by the more recent developments, that the Chesapeake and Ohio Railroad Company, with its completed Railroad of 420 miles—unsurpassed in thoroughness of construction by any line of railroad in the United States, linking the waters of the Chesapeake Bay to the Rivers and Railroads of the Great West and running through one of the richest mineral regions in the world; with its valuable franchises for extension and branches, and for bridging the Ohio River; with its abundant resources for remunerative traffic; with its capable and honorable management, and unexceptionable standing and credit, is entering upon a career of usefulness to the commerce and industry of the country, and of legitimate enrichment to itself, which will give it a leading rank among the great and successful enterprises of our times.

Very respectfully,

FISK & HATCH.

Persons desiring to reach the Chesapeake and Ohio Railroad, from New York, can take the steamers of the Old Dominion Line, from pier 37, North River, at 4 P. M., and connect with cars at Norfolk the following afternoon, or at Richmond on the second morning; or, they can leave New York by the Pennsylvania Railroad from the Cortlandt st. or Desbrosses Street Ferries for Washington, D. C., and thence *via* the Fredricksburg Railroad to Richmond, or *via* the Orange and Alexandria Railroad, to Gordonsville, thence *via* the Chesapeake and Ohio Railroad to Richmond, or the West, as may be desired.

Passenger trains leave Richmond for the West: Mail train at 8.30, A. M., arriving at White Sulphur Springs at 8.05, P. M., Express train, at 10.00 P. M., arriving at White Sulphur Springs at 8.03, A. M.

Passengers leave Cincinnati by steamers *Fleetwood* and *Bostona*, at 3 P. M., arriving at Huntington at 9 A. M. Trains leave Huntington for the East: Express train at 10 A. M., Accommodation, at 3.20 P. M.

LIST OF STATIONS AND TABLE OF DISTANCES ON THE CHESAPEAKE AND OHIO RAILROAD.

FROM RICHMOND To	Miles.	FROM RICHMOND To	Miles.
James River, wharves.....		Craigsville	159 $\frac{1}{2}$
Richmond		Bells Valley	164 $\frac{1}{2}$
Atlee's	9	Goshen [Stages to Springs]....	168 $\frac{1}{2}$
Ashcake	12 $\frac{1}{2}$	Millboro'	175 $\frac{1}{2}$
Peake's	14 $\frac{3}{4}$	Griffiths	186
Hanover	18 $\frac{1}{4}$	Longdale	188 $\frac{1}{4}$
Wickham's	21	Clifton Forge	191 $\frac{1}{2}$
South Anna	22 $\frac{3}{4}$	Jackson's River	195
Junction [Fredericksburg R. R.]..	27 $\frac{1}{2}$	Covington	205 $\frac{1}{2}$
Anderson's	30 $\frac{1}{4}$	Callaghan's	211
Noel's	33 $\frac{1}{4}$	Alleghany	221 $\frac{3}{4}$
Hewlett's	35 $\frac{1}{2}$	White Sulphur	227 $\frac{1}{4}$
Beaver Dam	40	Ronceverte	238
Green Bay	43	Fort Spring	244 $\frac{1}{2}$
Bumpass	45	Alderson	251 $\frac{1}{4}$
Buckner's	47	Talcott	262 $\frac{1}{2}$
Frederick's Hall	50 $\frac{1}{4}$	Hinton	272 $\frac{1}{2}$
Tolersville	56 $\frac{1}{4}$	Meadow Creek	285
Louisa	62	McKendree	295 $\frac{1}{2}$
Trevillian's	66 $\frac{1}{2}$	Dimmock	307
Melton	72 $\frac{1}{2}$	Sewell	314
Gordonsville [Orange & Alex. R.]..	76	Hawk's Nest	325 $\frac{1}{2}$
Lindsay	80 $\frac{3}{4}$	Laurel	327 $\frac{1}{2}$
Cobham	83	Kanawha Falls	334 $\frac{1}{2}$
Keswick	89 $\frac{1}{2}$	Loup Creek	338 $\frac{1}{2}$
Shadwell	93	Cannelton	344
Charlotttsville, [Lynchburg]	97	Paint Creek	349 $\frac{1}{2}$
Ivy	104 $\frac{1}{4}$	Coalburg	354
Mechum's River	107 $\frac{1}{4}$	Brownstown	361 $\frac{1}{4}$
Greenwood	115	Alden	365
Afton	119 $\frac{3}{4}$	Charleston	370 $\frac{3}{4}$
Waynesboro'	124	Spring Hill	376
Fishersville	129	St. Albans	382 $\frac{1}{4}$
Staunton [Valley R. R.]	136 $\frac{1}{2}$	Scary	386
Swoopes	144 $\frac{1}{4}$	Scott	390
Siberton	147 $\frac{1}{4}$	Hurricane	396
North Mountain	149 $\frac{1}{2}$	Milton	402 $\frac{1}{2}$
Variety	152	Barboursville	411 $\frac{1}{2}$
Elizabeth	153 $\frac{1}{4}$	Guyandotte	418
Pond Gap	155	Huntington	422 $\frac{1}{2}$

CHESAPEAKE AND OHIO RAILROAD CO.

OFFICERS AND DIRECTORS.

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C. P. HUNTINGTON,
New York.

VICE-PRESIDENT,
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Banking House of FISK & HATCH,

No. 5 NASSAU STREET,

New York, May 1, 1873.

We recommend as safe and desirable Securities for the exchange of Government Bonds, or for new investments,

The Chesapeake & Ohio Seven Per Cent. Bonds, interest payable January 1 and July 1. Principal and interest payable in gold in New York City. Bonds of \$1,000 each, either coupon or registered; secured by a First Mortgage upon the eastern extension of the road from the present depot at Richmond, through Church Hill Tunnel, to the docks on the James River, and down the Peninsula to the proposed point of terminus at deep-water on the Chesapeake Bay, together with the Docks, Warehouses, and all other property connected with this portion of the Road; upon the proposed Kanawha River Branch; and upon the great bridge to be built across the Ohio River at Huntington, to connect the present Western terminus of the Road, with projected lines in Ohio to Cincinnati, Portsmouth, Dayton, Chicago, Saint Louis, and the Northwest; and, in addition, by a second mortgage upon the main line of the road between Richmond and the Ohio River, and all the present and future equipment required for its extensive business.

This mortgage thus commands the two ends of this great East and West Trunk Line of road, and its outlets to deep water on the East, and across the Ohio River on the West, (which must ultimately be among the most valuable and important portions of the Company's property) besides being a lien upon the entire road and equipment.

The Chesapeake & Ohio Six Per Cent. Bonds, interest payable May 1, and November 1. Principal and interest payable in gold in New York City. Issued in denominations of \$100, \$500, and \$1,000; either coupon or registered.

The Chesapeake and Ohio Railroad is completed and in operation from Richmond to Huntington on the Ohio River, a distance of 420 miles, and has entered upon a large and rapidly increasing business. This portion of the Road and the present equipment, to which large additions are being constantly made, is worth not less than 35 to 40 millions, and at a moderate estimate of its prospective traffic in the transportation of products and merchandise between the East and West, and in bringing to market the immense resources in Iron, Coal, Salt, Timber, etc., which line its route will, it is believed, within a few years, earn interest on at least 50 millions.

The eastern extension, by means of which the cars loaded with Western products and the mineral wealth of the vast Iron and Coal fields of Virginia and West Virginia, can be laid directly alongside the largest ships in the world at the best and most accessible harbor on the entire Atlantic Coast line of the United States, and receive in return their cargoes of manufactured and imported goods for the West, is now in progress, and when completed will add immensely to the value of the entire Road, and to its facilities for a large and profitable business.

We continue to deal in Government Bonds, receive deposits on which we allow interest, make collections, execute orders at the Stock Exchange for cash, and do a general Banking business.

FISK & HATCH.

Gaylord Bros.
Makers
Syracuse, N. Y.
PAT. JAN. 21, 1908

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